CW SAMPLE COPY
MI48106UIVYMUIVYM FCWB FC
UNIVERSITY MICROFILMS
SERIAL PUBLICATIONS
300 N ZEEB RD
ANN ARBOR MI 48106

NEWSPAPER

COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

Weekly Newspaper Second-class postage paid at Boston, Mass., and additional mailing offices © 1974 by Computerworld, Inc.

ear May 8, 1974 Vol. VIII, No. 19

News Update

IBM Conversion Ills Threaten Teale Contract

By E. Drake Lundell Jr.
Of the CW Staff

SACRAMENTO, Calif. – The whole future of the Teale Consolidated Data Center here may be in doubt since IBM is having difficulties in meeting the conversion deadlines called for in the disputed $19.9 million contract.

IBM spokesmen last week admitted during legislative hearings here that the firm had "underestimated" the complexities of the conversion of the department of motor vehicle records for the system and that that part of the project may be four to five weeks behind schedule.

At the same time, officials in the state government overseeing the project indicated there were also problems in converting the interim center to the new

(Continued on Page 3)

Uncertainty Clouds Court Ruling on FBI

WASHINGTON, D.C. – Civil rights lobbyists and FBI bureaucrats alike are taking a "wait-and-see attitude" in the wake of last week's precedent-setting ruling by the Court of Appeals for the District of Columbia that would require the FBI to remove from its criminal files the arrest records of persons who were later exonerated of charges [CW, May 1].

It now appears that the ruling will have little immediate effect until federal legislation, now pending, establishes actual procedures for implementing the court decision, the sources here said.

In the decision the court ruled that the FBI "had no authority to retain" the record of Dale B. Menard in its files.

Menard had been arrested in Los Angeles in 1965 on suspicion of burglary, but was never formally charged with the crime. His fingerprint card, nevertheless, was forwarded to the FBI and his name

(Continued on Page 3)

On the Inside This Week

ABA Finds Public Apathetic Over EFTS — Page 4

GSA to Discontinue Sole-Sourcing of DP — Page 63

Communications 39
Computer Industry 63
Editorial 22
Financial 82
Societies 53
Software/Services 35
Systems/Peripherals 45

IBM Project Chief Finds

90% of Sites Lack Orderly Security Plan

By Don Leavitt
Of the CW Staff

ATLANTA – Users concerned with security hazards should look first at things that really happen and that have a high dollar impact if they do, Robert H. Courtney urged a bank DP auditors meeting here recently.

The manager of IBM's data security and privacy project told the Eastern States Association of Bank DP Auditors to have more than a "knee-jerk" response to a suddenly exposed security problem. In the past four years, he said, he has visited some 400 DP centers and "almost 90%" didn't have any orderly approach to the security question.

Problem Checklist

He pointedly avoided any discussion of IBM's multimillion dollar effort related to internal security of computer systems themselves. Instead, he gave the auditors a checklist of items they should recognize as major problems they could handle.

First on his list – "by a wide margin" – is the problem of errors and omissions, and simple "mechanical errors" by employees who are certainly not disloyal. Two separate runs of a bank's checking account system in the second and then the third shift of a service bureau operation, he noted, created chaos among the center's customers.

Dropping a disk pack and then attempting to use it without having it checked by a customer engineer has ruined "many a spindle, and then more disk packs when they were used on the damaged spindles," he said.

Courtney cited disloyal employees as the second most serious problem the auditors should consider. But he was clearly pessimistic about what the auditors – or almost anyone else – could do about this problem. No one knows how large the problem is, he said, and many companies are reluctant to prosecute even if they do finally catch an embezzler.

(Continued on Page 2)

NCC to Hear Results of IBM Study

CHICAGO – Full results of IBM's two-year, $40 million study of the issue of computer security are scheduled to be presented here at the National Computer Conference, Thursday, May 9.

The report will run a total of 25 volumes and contain 4,000 pages of information on the philosophical background of the security and privacy problem, specific technical moves that can be taken to protect privacy and an analysis of the efficiency of those moves. Robert H. Courtney, manager of IBM's data security and privacy project, will deliver the report.

Vice-President Gerald Ford will also address the convention outlining the Nixon Administration's program to protect the privacy of data on individuals.

Should DP Firms Trade With the East?

Two bills that could play an important role in increasing or reducing business for U.S. computer manufacturers with Eastern Bloc nations are up for renewal this year – the Export Administration Act of 1969 and the Export-Import Bank Act of 1945.

The debate over easing trade restrictions – especially on sales to the Soviet Union and Eastern European countries – centers as much on political philosophy as on business and technical subjects.

Following are two conflicting philosophical views on the subject – views which will be an important part of the national political scene for the next year.

FOR

Ups Trade Balance

By Nancy French
Of the CW Staff

WASHINGTON, D.C. – Without the sale of computer equipment overseas last year, the U.S. may well have ended up with an unfavorable balance of trade, William C. Norris, chairman and chief executive officer of Control Data Corp., indicated here last week.

Pushing for more trade with Eastern European countries, Norris said the favorable balance of trade in the computer industry amounted to $1.3 billion, while for the nation as a whole the favorable balance only reached the $700 million mark.

If the computer industry is going to continue to bolster the U.S. balance of trade, "the industry needs help from the government to create a climate facilitating trade rather than stunting its growth and making us difficult to do business with," he added.

"There can be little doubt that since 1945 export legislation restricting the overseas sale of computer technology has been our intention." Rather than continuing broad restrictive trade policies "to protect the national security," Norris suggested that what constitutes a "national security problem" might be interpreted better by government with help from industry people.

Testifying before the International Finance Subcommittee of the Senate Committee on Banking, Housing and Urban Affairs, and later the House International Trade Subcommittee of the Banking and Currency Committee, Norris criticized the implementation of the present Export Administration Act citing specifically the impotence of technical advisory committees in setting policy and helping determine which commodities and technical data are, or should be, subject to export control for national security reasons.

The present system allows committee members to "serve as individuals and not as industry representatives," he said.

Although they were intended to advise and assist the Secretary of Commerce in carrying out policy concerning export

(Continued on Page 2)

Century Line Set For 3 Additions

By Vic Farmer
Of the CW Staff

CINCINNATI – NCR is slated to unveil the Century 151, 201 and a lower-priced version of the Century 50 here this week at the annual meeting of the NCR Users group. The Century 151, an intermediate step between the Century 101 and 200 systems, is the first NCR mainframe to use 1K-chip metal oxide semiconductor (MOS) memory similar to that used in the recently announced Control Data and Honeywell computers.

The basic 151 starts with 32K MOS memory which can be incremented to 128K. Cycle time is 750 nsec per three bytes (the 101 is 1.2 μsec per two bytes, the 200 is 650 nsec per two bytes).

(Continued on Page 3)

AGAINST

Like Selling A-Bomb

By Nancy French
Of the CW Staff

ALTON, Ill. – The American computer manufacturers who sell computers to the Soviet Union can be compared to those individuals who turned over U.S. atomic secrets to the Soviets – people "who were punished by jail and death sentences," a prominent Republican charged last week.

"It is our computer technology that is keeping us ahead of the Russians . . . A computer purchased ostensibly for crop planning can also be used to compute trajectories of intercontinental ballistic missiles with MIRV warheads," warned Phyllis Schlafly.

The conservative Republican spokesperson, author of *A Choice Not An Echo*, made the remarks in a recent *Spectrum* broadcast over the CBS Radio Network, and she explained her position in a telephone interview last week.

'Russians Pay 10%'

"It doesn't make sense," she said, "to reward those people who turn over our computer technology to the Soviet war machine with Export-Import Bank funds. The Export-Import Bank gives a loan of 45% of the cost of the computer, and then [it] will guarantee a loan from a private bank like the Chase Manhattan for another 45% of the purchase price. Then the Russians only put up 10%," she said.

"Furthermore, Ex-Im, as it is called, gives loans at 6% and 7% interest rates and you know what kind of rates we're paying now. That's very preferential treatment. And I don't know what kind of security – if any – they are putting up," she said.

"Compare this to an American firm that wants to get a loan.

"If you're a blue-chip company like

(Continued on Page 2)

Security Chief Finds Sites Lack Orderly Approach

(Continued from Page 1)

Fire was next on Courtney's list. Though the probability of a fire is low in most DP centers, the dollar impact from a fire can be extreme. Most centers have made poor choices of fire-fighting or detection equipment, have put it in the wrong places and have no serious plans for recovery after a fire, the auditors were told.

Disgruntled employees can cause serious problems, Courtney noted, even if they aren't interested in the same financial gain as a potential criminal.

To illustrate, he told of a tape librarian who was left on the job even after she had been given her notice. Systematically she shifted outside paper labels from one reel to another and finally labeled blank tapes, leaving the library worthless by the time she departed.

Water and other leakages ranked number five on Courtney's checklist. He was less concerned about natural disasters over which DP centers have little control than he was about man-made situations, and the meager efforts made to offset such problems.

He urged the auditors to see that their centers had a supply of heavy-duty plastic sheeting – and scissors. You can't cut the stuff if scissors aren't there" – to protect equipment from leakage.

Plan Ahead

Plan, too, to avert problems before they take place, he went on. He cited a large DP center that was positioned between a paint shop and a paint supply area, with a pipeline between the two above the computer. The pipe broke one day as zinc chromate was being moved, and as a result, IBM had returned to it "the most completely rustproof 195 in the world today."

Data communications was the sixth area on Courtney's list. This concern should cover terminals and other equipment, he said, but may usefully include human communication as well.

To illustrate how misinterpretation can, in some cases, be a deliberate goal of the person preparing a statement, Courtney told the auditors of a radio ad that asked, "Are you getting only 5 point three percent interest for your savings?" Then threw in the zinger: "We'll pay you 5 point 18 percent."

Trading With East Will Up Trade Balance: Norris

(Continued from Page 1)

administration, the activities of the committee have been limited to providing technical advice in the strictest sense of the word – effectively barring the committee from policy considerations, he noted.

Rather than the present system in which each transaction with a Socialist country is subject to a separate determination from the President, and a subsequent report to the Congress within 30 days, Norris recommended that the President issue a blanket authorization, subject to whatever Congressional review procedures might be reasonable.

Military Projects

Norris said that given the current state-of-the-art with regard to computers in the Soviet Union, "there is no evidence that the USSR has been unable to carry out any important military projects for the lack of computer technology. Their computers are only three to four years behind our own," he said.

He pointed out that the Eastern European countries have developed their own computer industry based on the Ryad family of computers.

"Although somewhat behind schedule, computers are being delivered now," he said. He warned that at least one model, the 1040, is being prepared by East Germany for export markets, and potential Eastern European customers are being directed to use Ryad equipment rather than the computers of U.S. or Western European manufacturers.

Norris defended the Export-Import Bank, saying the bank provides "the lifeblood of many U.S. corporations doing business worldwide including with the Socialist countries.

"Local financing is not always obtainable," he said, "and moreover, local financing is available at rates or under conditions that render U.S. prices noncompetitive versus foreign manufacturers who are enjoying the benefits of export incentive programs."

"Control Data is seeking cooperative ventures involving technology interchange with the Soviet Union," Norris said.

Fair Exchange

He emphasized, however, that Control Data wasn't interested in giving away something for nothing – or even for cash.

"Basic to our concept of cooperation is our policy that Control Data does not normally sell technology, but will only offer it where improved access to the market is realized or technology of equivalent or greater value is received," he said.

In technology interchange of this type, "program phasing is a key ingredient – the rate of the transfer of technology from Control Data," for example, depends upon the "flowback of technology from the USSR."

Norris noted that trends have changed. "All the simple things have already been done with computers. Future computer technology challenges lie mainly in the development of applications software" rather than hardware.

"Many areas of computer applications will be at best seriously delayed" until the cost of developing the programs can be spread – especially in education and health care – areas that are "beyond the capabilities of one country, let alone one company," he said.

"The USSR is an extremely attractive partner for cooperative activities in health care and education, since they have the structure to implement pilot procedures of a substantial scale, which we believe are a necessary ingredient to major progress in applying computer technology to these fields," he said.

Like Selling A-Bomb: Schlafly

(Continued from Page 1)

General Motors, you can borrow at the prime rate which is 10-1/2%. If you're somebody else, it'll probably cost you 11%. Then the bank won't put up more than about 60% of your planned expenditure. You have to put up the other 40% yourself," she said.

The duration of your loan will be about 10 or 15 years if you have good salable real estate to secure it, or maybe five years if you have non-real estate security," she continued.

"Now, compare that to the Russians. We know they have a bad credit rating. They never did pay back their $11 billion lend-lease debt from World War II. And we've now agreed to compromise that at about seven cents on the dollar," she said.

"Instead of paying 11%, like U.S. businessmen, they're paying only 6% interest. Then they are getting 20-year loans, roughly double what American borrowers can get, and finally, in the end, the poor old taxpayer ends up footing the bill," she said.

"The American taxpayer foots the bill because the Export-Import Bank guarantees the loan, and when it's not repaid, [the bank has] a claim-right directly on the U.S. Treasury.

"The businessmen who are promoting this kind of trade don't stand to lose anything," she said.

Asked whether she objected to the sale of U.S.-manufactured computers to the Soviet Union because of their alleged failure to pay their bills, or because of the possible loss of our technological advantage, Schlafly said, "I object to it on both grounds. Especially because of the military advantage they are gaining.

"The Russians," she asserted, "are putting 40% of their gross national product, which is about half of ours, into weapons. We're only putting 6% of our gross national product into military spending and a large part of ours goes into payrolls and so forth."

Schlafly said this has become an issue in the last two or three years because government trade restrictions have been easing.

"To ship anything out of the country you have to get a shipping license through the Department of Commerce," she explained. Somehow those licenses just didn't get issued for computers until just the last couple of years. Things have changed and [the computer manufacturers] are getting them – not freely – but if they make a good case, know the right people . . .

"The earliest computer sale to the Soviets that we could track down was one sold in 1959 by Elliott Automation of England. England has been selling them for a while," she noted.

"Then, in 1972, Control Data Corp. sold a third-generation CDC 6000 system to the Soviet Union.

"The biggest supplier of computers has been an English firm – International Computers and Tabulation, [now ICL]. My information shows they have sold 27 of 33 large computer systems to the Soviet Union," she explained.

When asked why she was so convinced that the Soviets would use American-made computers in weapons systems, she answered, "Well, they are essential to the weapons. You can't send a space vehicle or a missile up without a computer."

To support her view, she said, "I think it's generally recognized that the U.S. is way ahead of everybody else and certainly way ahead of the Russians in computers.

"The Russians have been able to do a great many things," she explained, "but computer technology is their great deficiency. Our computers, on the other hand, have been fantastic. The Soviets are very eager to get our computers, just as they've been eager to get our wheat," she said.

Schlafly placed responsibility for easing trade with the Russians in the lap of Secretary of State Henry Kissinger.

"There's been a push for [a change in the trade policy] for years but I would say at the present time it's the Kissinger policy. The policy of our country always was to be militarily the strongest in the world.

"But with the advent of Kissinger, the policy of military superiority has been abandoned in favor of a policy of detente – getting along with the Russians – and giving them the goodies."

Tornado-Hit Xenia Cleans Up

XENIA, Ohio – While the cleanup of debris continues after last month's tornado [CW, April 17], Central State University's computer is getting a spring cleaning.

The NCR Century 100 has been removed from the administration building at CSU which was heavily damaged, and has been taken to the company's district office in Dayton where field engineers are replacing the entire filtration system.

Aside from excessive dirt, a firm spokesman said the system seems undamaged.

The Century 100 will be held at the district office until university officials decide where they want it delivered and installed.

Meanwhile, NCR has given CSU access to a Century 100 at NCR marketing/software headquarters in Dayton. The university is using the CPU five hours a day to keep up with its normal production work, such as updating the budget, student scheduling and payroll.

CSU students are attending other universities in the area which are providing classroom space. CSU officials expect 80% of the damaged campus to be rebuilt by next fall.

COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY
TM Reg. U.S. Pat. Off.

DR. H.R.J. GROSCH, *editorial director*
EDWARD J. BRIDE, *editor*

RONALD A. FRANK, *associate editor, technical news.* E. DRAKE LUNDELL JR., *associate editor, general news* and *computer industry.* MARVIN ARONSON, *editorial production chief.* V.J. FARMER, *systems editor.* DONALD LEAVITT, *software editor.* MARY UPTON, *financial editor* and *assistant computer industry editor.* LESLIE FLANAGAN, *photography editor.* JUDITH KRAMER, *copy editor.* PATRICK G. WARD, TONI WISEMAN, MARGUERITE Y. ZIENTARA, *staff writers.*

MARVIN SMALHEISER, *West Coast bureau.* J.H. BONNETT, *European bureau.* HIDETSUNA SASAKI, *Asian bureau.*

CONTRIBUTORS: J. DANIEL COUGER, *education column;* ALAN TAYLOR, *Taylor Report* and *professional practices.*

NEAL WILDER, *vice president – marketing.* DOROTHY TRAVIS, *sales administrator.* JUDY MILFORD, *advertising coordinator.* KATHRYN V. DINNEEN, *market research.*

LEETE DOTY, *production manager.* HENRY FLING, *production supervisor.*

W. WALTER BOYD, *publication manager.* PATRICK J. McGOVERN, *publisher.*

EDITORIAL OFFICES: 797 Washington St., Newton, Mass. 02160. Phone: (617) 965-5800. Telex: 92-2529. Los Angeles: 963 N. Edgecliffe Drive, Los Angeles, Calif. 90026. Phone: (213) 665-6008. Europe: Computerworld, c/o IDC Europa, Ltd., 140-146 Camden Street, London NW1 9PF, England. Phone: (01) 485-2248/9. Asia: Computerworld, c/o Dempa/Computerworld Company, Dempa Building, 1-11-15, Higashi Gotanda 1-chome, Shinagawa-ku, Tokyo 141. Phone: (03) 445-6101. Telex: 26792.

Second-class postage paid at Boston, Mass., and additional mailing offices. Published weekly (except: a single combined issue for the last week in December and the first week in January) by Computerworld, Inc., 797 Washington St., Newton, Mass. 02160. © 1974 by Computerworld, Inc.

50 cents a copy; $12 a year in the U.S.; $13 a year in Canada; all other foreign, $36 a year. MARGARET PHELAN, *circulation manager.* Four weeks' notice required for change of address. Address all subscription correspondence to circulation manager, Computerworld, 797 Washington St., Newton, Mass. 02160

Reproduction of material appearing in *Computerworld* is strictly forbidden without written permission. Send all requests to publication manager.

Computerworld can be purchased on 35mm microfilm in half-volumes (six-month periods) through University Microfilm, Periodical Entry Dept., 300 Zeeb Rd., Ann Arbor, Mich. 48106. Phone: (313) 761-4700. af

COMPUTERWORLD, INC.

Patrick J. McGovern . . . . . *president*
W. Walter Boyd . . . . . *executive vice president*
Robert M. Patterson . . . . . *vice president–int'l.*
T. Neal Wilder . . . . . *vice president–marketing*

BPA ABP AIA

POSTMASTER: Send Form 3579 (Change of Address) to Computerworld Circulation Dept., 797 Washington St., Newton, Mass. 02160.

Board, Governor Split Over Arrest-Only Data in Files

BOSTON – Although Gov. Francis W. Sargent filed a bill two weeks ago to bar potentially discriminatory "arrest-only" records from a proposed criminal state data file, the state Criminal History Systems Board (CHSB) still might try to include such information in its planned criminal information computer system.

Much public disapproval of the board's move, according to CHSB legal counsel Richard Geltman, has caused the independent 15-member state organization to become virtually split as to a final decision.

In three recent public debates across the state, many community groups, public affairs and consumer organizations, and the Department of Mental Health echoed the governor's position against the inclusion of "arrest-only" data in the state system.

CW Update

Even though the present regulations of the proposed computer system require that non-conviction records be separated from those of convicted felons, a study of the CHSB proposed system conducted by the state committee on Criminal Justice revealed a major reason for the controversy. It stated that criminal justice agencies, according to present regulations, may obtain computer information, for example, "to conduct preemployment investigations" of job applicants.

The report also brought out that "up to 20% of the files which have been converted to data contain arrest information without any record of a court appearance for that arrest."

It went on to say that "in such instances, the arrested person may have been released by police or prosecutor without answering to formal charges in court."

As a result, the CHSB is still trying to determine why releases are not reported to the state police to complete and close the arrest records, Geltman explained. "We still don't know what the answer is," he conceded, adding, "A lot of people might not have been provided their rights."

Uncertainty Surrounds Effect of FBI Ruling

(Continued from Page 1)

entered into the computerized system, where it has been ever since.

One observer pointed out that the ruling would have had more impact if it had been handed down even two years ago when the public did not really understand the issues involved. In the past few years, the issues have gained wide understanding and support on the part of the public, he said.

Dorothy Glancy of the Senate Subcommittee on Constitutional Rights feels that a person currently wishing to have his FBI record corrected would have to sue the FBI.

"The FBI may be faced with a huge volume of cases as a result of this decision," she said.

Others feel this won't happen – that, instead, pending legislation will determine how and when the FBI begins to act on the matter.

"The FBI doesn't like it," Douglas Lea of the American Civil Liberties Union Privacy Project said. "It's like cutting off one of their fingers. They think of the files as just another tool; yet when they're asked to show what type of value a simple arrest record has for them, they have no facts or figures to prove it," he said.

Teale Center in Doubt

(Continued from Page 1)

consolidated operation and that the state was unlikely to accept the new system as scheduled on May 6.

In addition, a report to Senate Finance Subcommittee Number 1 also recommended that the amount of the award to IBM be cut by $5,639,611 because certain conversions called for in the contract can no longer be justified due to the problems IBM is having with the present conversions.

IBM admitted at the hearings to having problems with the conversion of the real-time portion of the DMV work, but other sources indicated problems were cropping up in the conversion of the batch-processing part of the DMV contract.

In total, the contract calls for penalties that could amount to as much as $10 million if IBM fails to perform as promised.

The other problems concern the Teale center itself where under the contract the state was to accept a dual configuration of 370/165s operating under ASP on May 6 to replace the interim center – one 165 under Hasp.

NCR Readies 3

(Continued from Page 1)

The 151 also uses the existing two-spindle NCR 657 disk drive to provide 96M bytes of storage per drive. Other previously announced components on the system include a 300 line/min printer, 300 card/min reader and a 30 char./min terminal printer terminal as an operator console. Two optional I/O channels are available.

NCR claimed the 151 will be competitive with IBM's System 3/15. The 151 is priced at $133,595 and rents for $2,675/mo on a five-year lease. Deliveries are scheduled to start in the first quarter of 1975.

The Century 201 uses the same core memory of the larger 251 and 300 Series of mainframes, and provides performance between the Century 200 and 251, according to NCR. The 201 has an enhanced I/O capability over that of the 200 and has eight I/O channels – one of which offers data transfer rates of 900K bytes.

The basic system starts with 64K memory which can be expanded up to 512K. It also includes a previously announced 300 card/min reader, 1,500 line/min printer and an NCR 657 96M-byte disk drive.

Seen by NCR as competitive with the IBM 370/145, the basic system 201 can be purchased for $300,000 or rented for $5,525/mo on a five-year lease. Deliveries will begin in the third quarter of this year.

NCR also announced a lower-priced version of the Century 50 – the Century 50/Model I.

The Model I leases for $1,050/mo on a five-year lease and is $250/mo cheaper than the standard 50; however, the Model I has a slower 125 line/min printer and NCR has unbundled a major portion of the programming field support applications. For both Century 50s, NCR has also added a $125/mo CRT console for users wanting to use the system interactively in a dedicated mode. The Model I will be available in the third quarter of this year.

WHO'S A

Don't commit for that other sort package yet! SyncSort III is coming.

(The new sort package for all sorts of IBM users.)

The SyncSort Stable

SyncSort I
High performance in a dedicated environment.

SyncSort II
Accelerated performance on systems supporting data chaining plus new operational features.

SyncSort III
Excellent performance on *all* 360/370 Systems with dynamic optimizations and adjustment for main memory.

We wouldn't want you to miss out on a good thing. Just because you didn't know it was coming. And SyncSort III — the versatile new sort package for *all* IBM 360/370 equipment — is just over the horizon.

Release dates are:

- OS and OS/VS versions — 2nd quarter '74.
- DOS and DOS/VS versions — 3rd quarter '74.

How come another SyncSort package?

Public demand. When users saw how good SyncSort I and II were, they asked for a new version with wider applications.

We retreated into the back room for a year and revamped SyncSort II. Still the best VS sort available.

Voila! SyncSort III gives even better IBM time reductions on variable-length sorting than SyncSort II. And while we were at it, we accelerated the performance of SyncSort II for larger systems and incorporated a tape sort for the convenience of our users.

With SyncSort III you are assured of good performance in any environment and retain the benefits of our still very valid SyncSort II:

- Time savings of 30-50% during sorting operations; 10-20% on non-sorting operations in the mix.
- Efficient use of disk space without JCL change. (Secondary allocation, non-contiguous work space and space release.)
- Statistical record.
- Easy to install. (Minutes not hours or days.)
- Proper vendor service (the Whitlow kind).

In addition, all SyncSort packages are scheduled to provide the following features:

- Support for all tape and random access devices.
- VSAM Support.
- In-Core Sorting Capability.
- New procedure for combining disk and tape as working storage.
- Checkpoint—Restart
- Re-enterant code.
- Additional VS optimization procedures.

Check out SyncSort III or the accelerated SyncSort II today.

Call us — (201) 947-8500. Or write.

Helping people sort out their problems is our business.

Whitlow Computer Systems, Inc.

222 S. Marginal Rd., Fort Lee, New Jersey 07024

Seeks Evolutionary Change

ABA Finds Public Apathy Over EFTS

By a CW Staff Writer

WASHINGTON, D.C. – It is "now timely and important to begin to assess" the future directions of computer-based electronic funds transfer systems (EFTS), but there is not yet a "climate of urgency" over such development, the American Bankers Association (ABA) said recently.

While it is important to begin to "measure the impact" of EFTS, the association said "this assessment, however, should be undertaken with the recognition that recent research shows a relatively high degree of satisfaction on the part of the public" with the current way of doing banking business.

Evolutionary Change

As a result of public apathy over the development of such systems, the ABA, in a letter to the Federal Reserve System, recommended "an evolution of new approaches and services, justified through market acceptance," rather than "initiating near-term, major overhaul of the system."

The Federal Reserve, the letter said, "should proceed with due care and great caution" in shaping policies that will affect the development of future EFTS programs.

Today, the letter said, there is a great deal of activity in the EFTS area, including:

- "Federal Reserve operation of automated clearinghouse facilities at request of and under control and ownership of regional automated clearinghouse associations.
- "Rapid growth of local automated clearinghouse study groups.
- "Approval by the ABA Board of Directors of a National Automated Clearinghouse Association.
- "Increased marketing activity in the areas of direct pay depositing and prearranged payments.
- "Various pilot operation of POS related payments.
- "Emphasis by retailers on POS systems and the resulting relationships with financial institutions.
- "Implementation of national electronic bank card networks.
- "Increased market activities on the part of EFTS-related computer, communications and peripheral vendors."

Who Needs It?

But even with all this activity, there is little call among the public for the initiation of EFTS systems, the group indicated, despite "rising costs for operating the payments system, and continually increasing paper volumes."

However, there are some steps that could be taken today to allow future growth of the systems, the group indicated.

The plan needs "further definition and clarification of terminology and procedures . . . the use of the electronic debit transfer mechanism should be approached cautiously." – ABA statement

First, "criteria and standards for interdistrict transfers should be formalized now, and be made common to all districts," the ABA told the Federal Reserve.

Secondly, "security provisions should be defined" for the operation of EFTS systems, the association said.

In discussing the role of the Federal Reserve in aiding the electronic transfer of funds, the ABA said the organization "should not seek to expand the scope of its services or the market for these services in ways which would endanger the survival of competing facilities."

The group also warned that direct access to any EFTS program run by the Federal Reserve should be limited to banks and not open directly to other institutions such as savings and loans.

'Several Concerns'

A proposal to allow member banks to use Federal Reserve facilities to collect funds electronically from another bank without customer prenotification "has the potential for effectively reducing paper volume over time," the group said, but added that the proposal raised "several concerns."

First, the plan needs "further definition and clarification of terminology and procedures," the ABA said, adding that "in view of the Federal Reserve's position of not accepting any liability, the use of the electronic debit transfer mechanism should be approached cautiously."

There is also a need for user protection features in the plans, the ABA said, including the right of the user to refuse to debit through the system without preauthorization.

In addition, the ABA said, "We do not consider large dollar items to be an appropriate part of the proposed system, because they do not contribute significantly to volume, and a substantial percentage of large dollar transfers are already effected by electronic means.

"Additionally, the concern over liability grows proportionately with the size of exposure per item," the ABA noted.

The Federal Reserve should not let technological advances "alter the scope and extent" of its role in the nation's check-clearing system, the ABA said, even though it should upgrade its facilities to provide more efficient service in that role.

"The Federal Reserve," the ABA said, "should avoid domination of these services; and the choice of alternative systems, as available today for check clearing, should continue," the ABA indicated.

Credit Files Opened

ATLANTA – Retail Credit Co. has bowed to increasing public pressure and the threat of a Federal Trade Commission examination by allowing consumers to see their entire credit records held by the firm.

Effective June 1, W. Lee Burge, president, said consumers who request it may read all reports submitted about them. Previously consumers had only been entitled to an oral discussion of their reports when those reports were used in investigations of their credit rating.

The actions of the firm go well beyond the requirements of the Fair Credit Reporting Act, which required the verbal explanation, Burge said.

However, a recently instituted FTC action had charged that the firm failed to disclose all relevant information to consumers in such oral reports.

Fastest recording paper in town!

New! Electrostatic recording chart paper by Graphic Controls

We've added electrostatic paper – in rolls and fan-fold packs – to our line. To give you precise print/plot reproduction with the new super-fast electrostatic writing technique. And to maintain our reputation as the recording chartmaker with the most complete line in the business.

As with every one of the more than 55,000 different charts of all types that we make, you can count on the finest quality electrostatic paper for the purpose. Delivered when you want it as you want it, from our inventory. And you'll save money in the bargain!

For more information write or call Ray Newstead, Industrial Products Manager, Graphic Controls Corporation, Recording Chart Division, 189 Van Rensselaer Street, Buffalo, N.Y. 14210.
Telephone: (716) 853-7500, Ext. 352

RECORDING CHART DIVISION
GRAPHIC CONTROLS CORPORATION
189 VAN RENSSELAER STREET, BUFFALO, NEW YORK 14210

'System Reliability Meetings' Keep Multivendor Shop's Uptime Over 99%

By Patrick Ward
Of the CW Staff

CHICAGO – In September 1972, the Blue Cross Association here, which does payment and credit authorization for local Blue Cross organizations across the country, was experiencing 20% to 30% downtime with one of its two HIS 3200 CPUs.

To resolve the problem, the association set up periodic meetings with HIS, setting specific time periods for the vendor to search through possible sources of the trouble and to report back, according to Eugene V. O'Halleran, senior computer operations manager.

Finally HIS traced the problem to a memory fault which was bothering other users. However, the Blue Cross Association decided to keep the problem-resolving meetings, formalize them under the name of "system reliability meetings" and extend them to all the association's vendors.

The Blue Cross Association is an all-HIS shop with over $4 million of purchased equipment. One of the two 3200s is dedicated to teleprocessing, and the other to administrative work.

CPU and memory uptime is now at 99.5%, O'Halleran noted, and the operating system's uptime is at 99.8%.

The Blue Cross Association went to an HIS OS 2000 operating system a year after its system reliability meetings began.

The association soon found 37 bugs in the operating system, O'Halleran said, and presented them in documented form to HIS on the first of January. A month and a half later HIS had resolved 23 of them, he noted.

Ten days is now the average time it takes Blue Cross to get a fix in the HIS software, O'Halleran added.

Because of its communications net, the association also deals with Western Union, which supplies it with about 35,000 miles of leased lines and 140 teletypewriters and Model 1259 modems.

Additionally, the association leases 20 Texas Instrument (TI) 960 minicomputers at remote sites for transmitting claims data.

O'Halleran said his group does its own testing and troubleshooting for problems. This allows the association to convincingly tell a vendor that the problem lies in his equipment, and so cuts down on "finger-pointing" between vendors.

Blue Cross now holds separate systems reliability meetings with each of these three vendors once a month, and vendor attendance is mandatory, O'Halleran stated.

Vendor representation typically includes the branch manager in charge of marketing for the area; the local sales representative; the manager of field service; manager of branch services; and for TI and HIS, the software manager for the area.

Blue Cross people open the meetings with a documented report of a problem, citing their view of its cause.

"We try to tell them where the problem is," O'Halleran said. "We say we want the problem resolved in a set time. They agree."

Blue Cross documents the agreement, and "thirty days later we ask them what they've done about it," O'Halleran remarked.

Follow-Up Key

The whole idea of the systems reliability meetings is to get top personnel together and then to follow up on how vendors have solved the problems, O'Halleran commented.

The written documentation means Blue Cross won't forget about a problem or the agreement to solve it "because we have a mechanism to keep bringing it up," O'Halleran observed.

"Getting a commitment from vendors to participate with high-level people" is the biggest obstacle to the success of a systems reliability meeting approach, O'Halleran noted.

"This interaction requires a lot of time when you start," O'Halleran observed. Then, the program picks up, he said, and vendors "have no problems with attending meetings."

It is unlikely that the systems reliability program would be as good as it is without the active role of a Blue Cross vice-president, O'Halleran stated. That vice-president's signature on letters makes a difference, he said.

In the rare instances where a vendor doesn't perform as agreed in the meetings, the Blue Cross vice-president calls a person of equivalent rank in the vendor corporation, O'Halleran noted.

A key part of the persuasion, he stated, is to emphasize the positive things good performance can mean to the vendor's image in the eyes of other user organizations familiar with the Chicago authorization center, O'Halleran said.

If persuasion doesn't work with vendors, O'Halleran observed, "we threaten to penalize them. If we're paying $3,500/mo maintenance, we will just cut the payment," he said.

But usually the vendors keep their commitments, O'Halleran said. "It's future business that they're after," he explained, and "their commitment is based on the fact that they want future revenue."

Sanders Abandons Teale Suit, IBM Named in Univac Action

SACRAMENTO, Calif. – Univac has added IBM's name to its suit against the State of California over the Teale Computer Center award, but Sanders decided to abandon the matter instead of adding IBM as a defendant [CW, April 3].

A source close to the Sanders legal effort indicated the firm "didn't want to air its antitrust grievances with IBM in a California court."

Rather, he said, the firm wanted to leave the issue of possible IBM antitrust violations out of the Teale case and possibly use them later in a broader suit against IBM for overall antitrust violations – and, he noted, if such a suit is forthcoming, it would probably be filed in Sanders' backyard in New Hampshire.

Since a California court had ruled that Sanders could not go on with its suit against the state without naming IBM as a defendant, the firm decided to drop the entire issue, he said.

It is understood that IBM is presently negotiating with Sanders in order to resolve the differences between the two.

On the other hand, Univac updated its suit against the state by naming IBM, Boeing Computer Services and Data 100 as "real parties of interest" in the case in a new submission here.

Evaluate People Proficiency Through SCOPE Diagnostic Tests

25 Different Multiple-Choice-Question Tests Provide Evaluation Tailored To Your 360/370 Installation

Analysts
SCOPE SUBJECTS
- System Analysis
- System Design

Programmers
SCOPE SUBJECTS
- COBOL, FORTRAN PL/1, Assembler
- Debugging
- Operating Systems (DOS, OS, VS)
- Telecommunications

Operators
SCOPE SUBJECTS
- Operator Functions
- Operating Systems (DOS, OS, VS)
- HASP

RESULTS PINPOINT SUPERIOR SKILLS – CRITICAL AREAS WHERE KNOWLEDGE NEEDS STRENGTHENING.

IDENTIFIES SKILLS IN WHICH PEOPLE CAN BE MOST PRODUCTIVE, REDUCES EXCESSIVE COST OF RANDOM TRAINING.

SCOPE IS VALIDATED AND USED NATIONWIDE IN EVERY MAJOR INDUSTRY. ALSO BY FEDERAL AND STATE GOVERNMENT AGENCIES.

To: Software Sciences Corporation, 888 Seventh Avenue, New York, N.Y. 10019 (212) 489-7880

Please send me more details on SCOPE tests for:

ANALYSTS:
☐ System Design
☐ System Analysis

OPERATORS:
☐ Operator Functions
☐ Operating System Facilities
☐ HASP

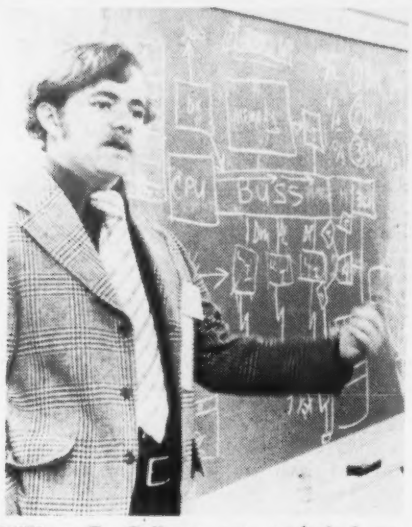
PROGRAMMERS:
☐ Assembler Language
☐ COBOL
☐ FORTRAN
☐ PL/1
☐ Operating System Facilities
☐ COBOL Debugging
☐ System Debugging

OPERATING SYSTEM:
☐ DOS
☐ OS
☐ VS

☐ Also send your System 360/370 Education Catalog

NAME _____
TITLE _____
COMPANY _____
ADDRESS _____
TELEPHONE _____

SOFTWARE SCIENCES CORPORATION



William G. Gallager gets technical on front-end processors.

Data General, Cullinane and Calcomp booths draw user attention.

Attendees look over Infoterm terminals used with the Prime 300 Virtual Memory System.

Caravan 74: Traces of Faces, Places

AT&T demonstrates the Dataspeed 40.

The Sycor 340 is viewed through a fisheye lens.

Scott Leeseberg makes a point on optical scanning.

General Computer Systems' staff shows off System 2100 for data entry.

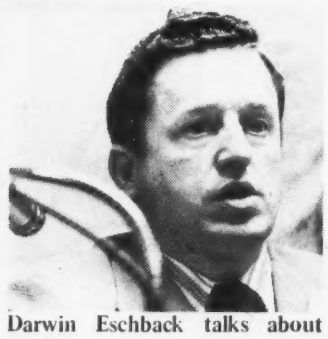
Dr. Frank Ryan advocates more computers for Congress.

DEC VT05 terminals are available for playing games.

CW Staff Photo Feature

Editor Ed Bride (standing) gives *Computerworld* report during data communications forum.

Edward Dolan expounds on the benefits of intelligent terminals.



Darwin Eschback talks about small systems management.

Stephen J. Vozella speaks on data communications.

Quantor's 305 Microfiche Viewer in action.

Herb Grosch (lower left) gathers reports from source data automation panelists.

Incoterm intelligent terminal minus housing.

Programmer Training, Appraisal a Unique Specialty

NEW YORK – Programmers and analysts are in a special data processing job category, one for which performance and effectiveness are regarded as the most difficult to measure, according to a Computer Caravan session on personnel here.

The difficulties range from determining the necessary qualifications for an entry level programmer, to training and finally to evaluation of performance.

The first step in hiring an entry level programmer is to determine what qualifications he *must* have, and to separate these from those you would like him to have, said Joe St. Onge, training director for Pepsico.

There are four necessary elements in effective employee selection, he said: detailed job definitions; good communications – with the employee, the personnel department and with each other; disciplined interviews; and good recordkeeping to determine if the original decision to hire was right.

Once the programmer has been hired, training to enhance productivity becomes the overriding goal, according to Linda Jones, senior analyst at Loeb Rhoades.

One important skill Loeb Rhoades expects entry level programmers to have after training, Jones said, is the ability to work as a member of a team. "We expect them to be able to accept criticism," she said, "to take a beating for the sake of getting the job done."

Programmers must also be able to design programs and modules, have mastered language syntax, have some knowledge of JCL, have some experience with program maintenance and understand how to utilize software.

To achieve these goals, she said, programmers are trained in groups of four to six for two to three months.

The team concept in programming was also praised as a way to better evaluate personnel performance.

David A. Nelson, independent consultant, noted, "Usually we have had to rely on personal observation and project leader appraisal, in lieu of concrete criteria, for evaluation. Today, the productivity improvement techniques being promoted by IBM provide much more comprehensive and objective data for programmer appraisal than any management methodology I know."

Nelson stated that all too often evaluations are based on extraneous, but readily observable indicators, such as neatness, punctuality, politeness and the ability to look industrious.

"IBM is rather stridently urging all of us to adopt these productivity techniques as the methodology for all program development projects," Nelson said. These techniques include the "chief programmer team" method of operation, top-down program development and structured programming.

These new techniques, he said, allow a manager to measure the accomplishments of the team, and each team member, in terms of such work output as coding submitted for keypunching, adding and updating program modules, assembling or compiling programs and submitting test runs for execution.

Careful Planning Can Preclude Problems of Multivendor Shop

By Toni Wiseman
Of the CW Staff

CHARLOTTE, N.C. – Multivendor installations have only become common in the last three to four years because, although hardware technology would permit a mix, the technical expertise within the average company did not allow it.

David P. Winstead, manager of data processing technical services for Pilot Life Insurance Co., gave some insight at a Computer Caravan session here into the problems and possible solutions a mixed shop can expect to encounter.

The central processors at Pilot Life are an IBM 370/135 and a 360/40. Other equipment includes two Cincinnati Milacron Apps 2000 minicomputers, a Honeywell Keyplex key-to-disk system. Terminal Communications TC160 CRT, Control Data Corp. 23142 double-density disk and Fabritek add-on memory.

A multivendor installation can present many problems, Winstead said, but many

Caravan/74

of these can be avoided with careful planning or resolved with intelligent handling.

For instance, Winstead said, second vendor (SV) equipment is normally 15% to 20% below prime vendor (PV). This means it is not difficult to realize savings of $5,000/mo or $60,000/year or more for a medium-scale installation.

Preventive maintenance (PM) scheduling can create a problem, he said, because not infrequently, both vendors will require the mainframe equipment for executing diagnostics and hardware tests.

"Since only one vendor can run his diagnostics at a time, your average PM allowance can be expected to increase proportionately," he said.

Rescheduling PM can alleviate some of the inconvenience caused by a lengthier PM time, he said. Another solution is to coordinate PM steps between vendors so that possibly both are able to execute their diagnostics at the same time.

Increased lapse time between failure and fix can result from the time you spend deciding which vendor to call, Winstead said. "In addition, arbitrating a 'finger-pointing' situation may cause lost time if a quick decision cannot be reached as to which vendor is responsible for fixing or diagnosing the problem," he said.

One solution to this dual problem is to designate the responsibility of problem prediagnosis to someone – possibly the systems programmer – who is likely to be proficient in both hardware and software areas, he opined.

"One alternative to prevent finger-pointing is to contract for third-party maintenance," Winstead said, "or contract with one of the vendors to maintain all equipment.

"Another method of reducing finger-pointing is to specify by contract that one of the vendors, usually the SV, is always responsible for any diagnosis when there is reasonable doubt as to which vendor has the problem," he added.

Winstead listed lower costs, better competition, specialized services and products, and the ability to shop and compare as the benefits a multivendor installation can expect.

COBOL

Make a date with the programmer's new friend. Call (201) 947-8500

Ask for COBOL COMPANION.
(The system that Whitlows problems down to size.)

Happiness is a COBOL COMPANION.
It makes a lot of things easier.
- Program development.
- Maintenance.
- Debugging.
- Uniformity.
- Conversion.
- Acceptance.
- Documentation.

We've developed a reputation for producing packages that whittle down IBM time during sorting operations. (Our highly regarded SyncSort line.)

Now we're breaking new ground. With a new system that simplifies the preparation and maintenance of COBOL programs.

It's called COBOL COMPANION and it's due for release soon.

What is it? Just another pretty face around the programming center?

Not on your life. It's a cohesive, hard-knit system that's warranted to shape up any COBOL programming operation.

Easily installed (in a matter of minutes), COBOL COMPANION immediately creates a more attractive operational environment.

There are approximately 20 different features which work in harmony:
- some features are designed for operational control.
- some features are designed to simplify programming.
- some features are designed for debugging.

Above all, management will like COBOL COMPANION because it produces a more effective, less costly programming operation.

Programmers will like it, too, because the mechanical aspects of program preparation are placed back in the computer where they belong.

Call us today and make a date with COBOL COMPANION. It's going to be a pretty popular package around town.

Whitlow Computer Systems, Inc.

222 S. Marginal Rd., Fort Lee, New Jersey 07024

Joint Data/Voice Facility Drops Cost of Growing Net

By Patrick Ward
Of the CW Staff

NEW YORK – A firm that combines its data and voice nets can lower its data communications costs even as volume rises, Robert Madan told a Computer Caravan workshop on on-line systems here.

Madan spoke from experience. He and a counterpart handling the voice nets, work directly under the vice-president in charge of communications at Equitable Life Assurance Co.

Equitable had earlier done a study of all the phone calls made in its offices over a three-month period. The company decided it could save money by putting in private line services between some of its offices, and an on-line data communications network is now built upon this voice backbone.

By procuring the private lines in bulk, Equitable trimmed its data communications cost even as volume mounted sharply, Madan said.

The company has an on-line system in which 142 IBM 1050s, 15 GE Terminets, 28 Model 35 and 30 Model 30 teletypewriters

Caravan/74

and a PDP-11 system access IBM 7080 and 370/168 CPUs, Madan said.

A Comten Model 60 programmable front end serves both host computers. The front-end system includes its own drum, disk and tape peripherals, Madan said. It does all administrative switching of the 128 lines without interfering with the hosts, Madan continued.

The front-end system also logs all incoming data and queues it on a drum. The front-end can monitor how much core is available, Madan explained, and when there's not enough available, it can switch data to the disk.

Regulated Batches

Equitable's on-line approach brings data to the hosts in regulated batches, depending on the priorities of the incoming messages.

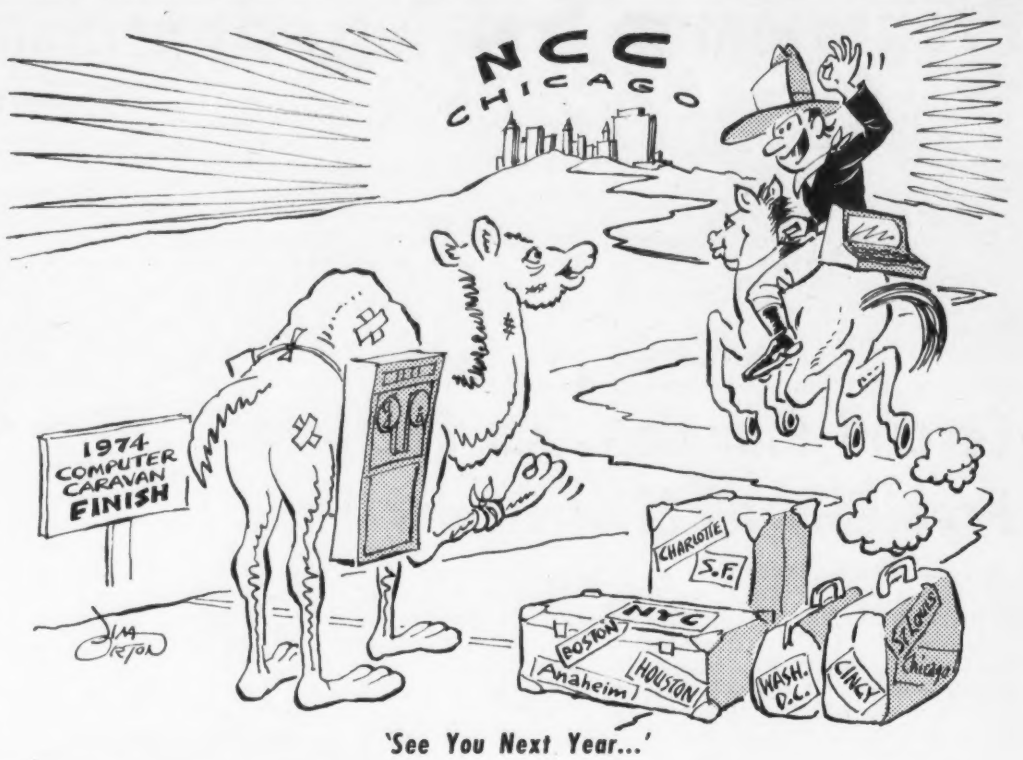
The idea is to balance the system, "distributing the workload to where there is the capacity to handle it," Madan explained.

Customized software in the front end sets the priorities, which Madan said has allowed throughput to climb from 60 to 80 message/min to almost double that now.

While regulating the host processor helped in this case, Madan said users should avoid doing it unless it is necessary.

He also cautioned on-line systems users not to write applications programs for particular types of terminals, but instead to write the program and then add on the particular terminal interfacing.

Then if the user later decides he'd like to go to a different type of terminal, he'll have less of a problem, Madan noted.



'See You Next Year...'

Students Honored For DP Endeavors

NEW YORK – In an effort to foster interest in careers in data processing, Raytheon Data Systems has honored an outstanding high school student in eight of the 10 cities visited by the Computer Caravan.

In each city, Raytheon contacted the superintendent of schools and asked that he select the area school system with the most advanced curriculum in computer studies. A student from that school was then chosen on the basis of high academic achievement and interest in the data processing field.

Selected students were invited to the Caravan, to allow them to see the various systems on exhibit and to get a chance to talk to people in the industry.

The students selected were: Roland McDonald, Ballou School, Washington, D.C.; Jan Becker, Walnut Hill High School, Cincinnati; Jay Thomas, High School of Visual and Performing Arts, Houston; Tony DaVanzo, Los Alamentos High School, Anaheim; Raymond Bazemore, Woodrow Wilson High School, San Francisco; Edward Dorner, St. Patrick's High School, Chicago; Charles Hale, Boston Technical High School, Boston; and Mordecai Beizer, Stuyvesant High School, New York.

Peak Periods Vital in Network Plan

NEW YORK – The teleprocessing user planning a network has to take into consideration factors such as peaks in his business, according to Tim McDonough, manager of teleprocessing systems for GAF Corp. He explained that in its original planning, GAF had failed to compensate for the peak summer business periods.

"Break your messages down into characters," he said, " and when dealing with forms, don't leave out spaces, control characters, etc."

How Urgent?

The next criteria McDonough covered is urgency – how soon information must be at its destination to be useful, how much delay can be tolerated, what the consequences of delay are and when the point of no return occurs.

"Volume and urgency are the two factors which determine the line speed," McDonough said. "And they can also determine the number of terminals you want to have out there in the field."

Distribution is another criteria essential to network planning, he said. This includes the number of data sources and points of distribution.

"This is where you really start to design the teleprocessing network, McDonough stated," and where you should begin to consider existing facilities."

Taking a good look at what facilities the company already has can save a lot of money when it comes to implementation of the network, he said.

Two Dozen Cheaper

Taking one of many examples, he said, GAF bought a Bell Telepak facility which provides 24 voice grade circuits between a Rensselaer, N.Y., installation and corporate headquarters in New York City. The company was only using 21 of these for voice, he said, but was paying for 24 because it is cheaper to buy the package than to buy 21 separate lines.

The cutoff point occurs at around 18 lines, he said.

When it was decided to implement the network, GAF was able to take two lines for data transmission, "and it didn't cost us anything because we already had the extra lines," he said.

Language is the next area to consider, he said, the code form in which the data is to be transmitted. "You have to start thinking about the multiple terminals in the network," he said. "For instance, a 3705 only operates on one block length, and what happens if you have a terminal that doesn't block?"

Accuracy is also important, McDonough said. "Remember that redundancy is expensive.

"Most errors in teleprocessing networks come from the telephone lines," he said. "When you're in a telephone company environment, dedicated lines are less prone to errors than DDD or Wats lines because you're not sharing switching equipment with anyone."

This is important, he said, because at a peak time with dial-up a call may be switched from Los Angeles to Butte, Mont., to New Orleans, Chicago, Philadelphia and Boston before it arrives in New York. "You can't hear it on a voice call," he said, "but it can kill you with data."

'Keep It Neat'

McDonough's final admonition was to "keep it neat and keep everyone's hands off. You don't want a lot of people getting into the guts of the system if you are the one who is responsible for the network function.

"The real question is how much manpower the company can afford to spend on the project," he ended.

'Antidote Central' Aids Possible Poison Victims

WRIGHT-PATTERSON AIR FORCE BASE, Ohio – The Air Force Avionics Laboratory here is dedicating a portion of its information and retrieval system, on a trial basis, to provide the base hospital support for a new poison control center.

An IBM 370/145 is providing doctors who man "Antidote Central," as it is known to base residents, instructions for treating patients who have ingested toxic substances.

A worried mother who has rushed into the hospital's emergency room with her son whom she suspects has swallowed a cleaning liquid might be treated as follows:

The doctor, accessing the computer with a Computer Communications CC-30 terminal, requests the files on cleaning liquids from Antidote Central. Within seconds, the console begins to display information on the product including its type, manufacturer and a breakdown of its ingredients.

Toxicity based on ingestion levels per weight group also would be listed.

A description of the symptoms to look for in the patient and how to treat them would also appear, and finally, all other known sources of information would be suggested to assist the doctor in making quick treatment decisions.

Used primarily for technical control and management, the system is a full text, interactive, flexible data retrieval system for use by nontechnical terminal operators.

The basic computer program was developed by Mead Technology Laboratories, Dayton. It supports 250 users with 68 remote terminals on Air Force bases coast-to-coast.

The Poison Control Center support service constitutes only about 1% of the work done by the base computer center, according to Jim Sayne, a public information officer.

If it proves successful, Sayne said the system will be expanded throughout the Department of Defense. Although it is technically feasible, no plan is presently being considered to tie in civilian hospitals.

Train Dynamics Studied

HUNTSVILLE, Ala. – The Nasa Marshall Space Flight Center here has begun a 20-month project to study the vibrational characteristics of railroad freight cars, geared to producing new information about the dynamic performance of long trains.

The first portion of the project involves gathering all available information about freight car vibrational characteristics. This information will be fed into a CDC 6500 and later processed with a Univac 1108 to check the accuracy of a mathematical model of the track-car dynamics.

Patients in Need Singled Out

COLUMBIA, Mo. – Suicidal and dangerous patients – sometimes lost in the myriad of patients and medical data here – are now readily identified by computer.

Eleven state mental hospitals, now tied to the University of Missouri Institute of Psychiatry Computer, can quickly determine which patients are in need of immediate medical attention because of acute mental problems. Before the computer link-up, according to a UM spokesman, medical records some three and four inches thick on each patient had to be perused by ward physicians to determine priority cases.

Now, however, doctors can get instant printouts with relevant medical data on patients who are most in need of treatment, he added.

Introducing: The Honeywell Information System

It's our family of people, products, and services. It includes new computer systems we call Series 60.

It's a family that will keep our customers purring.

The Honeywell Information System represents a dedication of Honeywell people to helping our customers achieve the goals they've set for their computer operations.

It signifies a re-emphasis in our product and service offerings on results-oriented, cost-effective performance.

It symbolizes our way of doing business in the information systems arena.

It's our way of summarizing Honeywell capability, commitment and continuity in response to customer needs.

It's a family with Capability:

We've just introduced Series 60.

Series 60 makes the promise of the future a reality now.

Series 60 has been designed to make it significantly easier to tap the power of the computer for results on the spot.

Series 60 offers new Honeywell advances in data base technology, information networking, and transaction processing—capabilities that will play a dominant role in computer operations of the next decade.

Series 60 complements Honeywell's already extensive product offerings. It includes seven computer models of advanced design, plus a variety of new peripherals.

With Series 60 we've enhanced our proven GCOS executive system and made it the basis for a graduated set of software capabilities tailored to match different levels of hardware performance.

Plus we're taking a number of other steps to provide users—regardless of their present systems—with a smooth and evolutionary path to increased performance.

So now, more than ever before, Honeywell has the capability you need for the results you expect.

If you're ready for your first or second computer, The Honeywell Information System is easy to understand, easy to install, and easy to use.

If you're an experienced user who is outdistancing the capability of your present equipment, The Honeywell Information System is the logical next step to increased performance.

And if you're a large user, The Honeywell Information System can provide superior efficiency in managed distribution of your company's information. Through use of Honeywell minicomputers, you can handle a complex information network operating in a variety of processing dimensions.

It's a family with a Commitment:

Honeywell's dedication to customers is the cornerstone of The Honeywell Information System.

With the development of Series 60, we've provided for the protection of our customers' current investment in hardware, software, and programming. Series 60 lets you continue with your current Honeywell equipment for as long as you want. And when you're ready to move to increased performance, you can make the move easily and with your application investment intact.

For example, our medium and large Series 60 systems have a compatibility mode which not only allows you to run existing programs written for your current hardware, but also lets you mix these programs with new ones written expressly for the new system.

It's a family with Continuity:

All kinds of changes affect the future of your computer operations: changes in your business, changes in your information structure, changes in computer technology and processing techniques.

With this in mind, as we introduce and continue to expand the capabilities of The Honeywell Information System, we're building a unique ability for Honeywell users to manage these changes and be prepared for the future.

We're doing this by evolving toward standard software and operational procedures that interface between the computer and your business. So as your processing needs grow or change in character, you'll be able to adjust easily. The way you go about operating your system will remain the same.

The new Model 62/60 is a low-cost first step into Honeywell's new Series 60 family. It has the potential for easy and unlimited growth.

The power you want for the results you deserve.

New high-performance hardware.

As you would expect from systems that initiate a new Honeywell family, our Series 60 represents the latest evolutionary step in computer design. For example, we've incorporated a number of advances based on our Multics System development.

But this is not technology to dazzle. It's technology designed to serve the user... to make a system more powerful, easier to use, and more reliable.

Features offered include multiprogramming systems architecture, large-scale integrated circuitry, solid-state memory, data privacy provisions, and extensive use of firmware.

Reliability was a major design objective for Series 60. Many features have been built into the systems to run continual checks on their accuracy.

If part of the system needs service, a fail-soft feature allows reconfiguration of system resources so processing can continue without interruption. The result is unexcelled availability of the system.

Model 66/80, a new large-scale system featuring Honeywell's famous GCOS executive software with advanced information networking, data base management, and transaction processing capabilities.

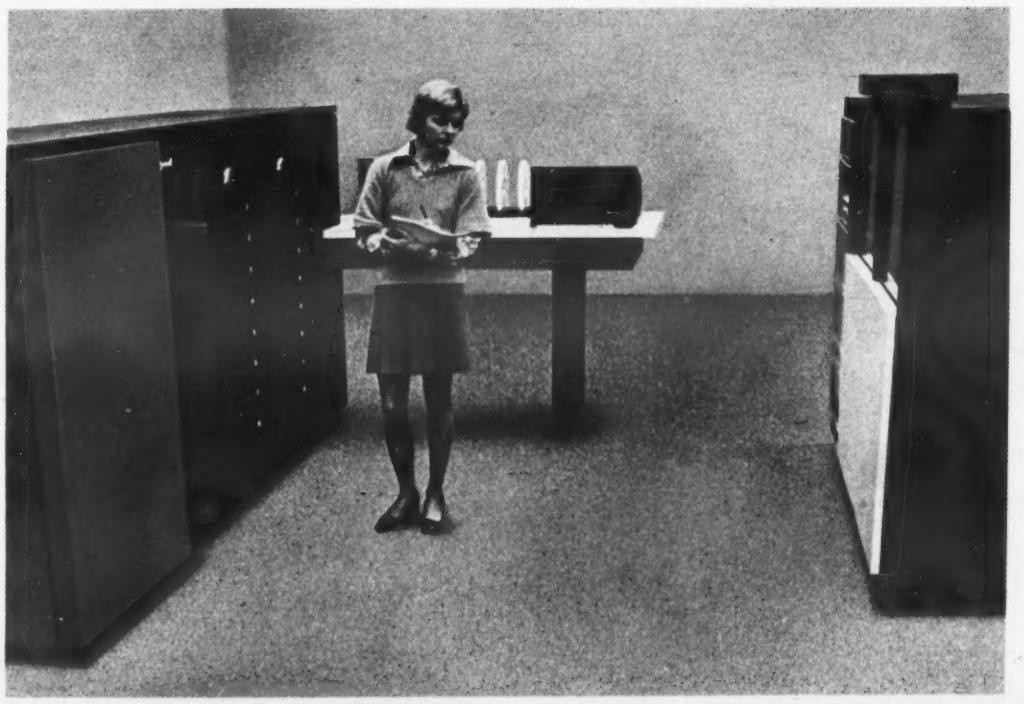
New high-speed printing efficiency

Honeywell's new Page Printing System operates offline to handle a complete printing function. Every sheet is an original of superior quality.

The system is designed to reduce overall printing costs, improve turnaround time, and operate with output tapes generated by systems of any manufacturer.

The system employs a quiet, nonimpact electrographic process delivering 140 to 210 pages per minute (12,000 to 18,000 lines per minute).

Capabilities include the preparation of 132-column reports in 11" by 8½" format, the printing of forms as well as data, the cutting of forms to lengths specified by the user, and the collating and stacking of output automatically.



GCOS is King.

For several years, Honeywell's General Comprehensive Operating Supervisor (GCOS) for our Series 6000 computers has been one of the most versatile and respected executive systems in the industry.

With this kind of success for encouragement, we've enhanced GCOS and made it the software standard for Series 60. We've made it available in several different levels of performance. And we have compatibility features to make the growth path to GCOS an easier one, regardless of a user's current hardware.

The reputation GCOS enjoys comes both from its superior ability to manage a computer system efficiently and from its reliability.

In addition to being a leading operating system, GCOS is also a leader in data base management and information networking and is rapidly becoming a leader in transaction processing. These are the capabilities which make it much easier for users to access computer resources, and which are sure to play a major role in computer operations during the next decade.

With Honeywell's GCOS software, these capabilities are not just a promise for the future, but a reality now.

Flexible multidimensional capability

The full range of GCOS capability offers proven multiprogramming, multiprocessing, local and remote batch processing, plus the latest concepts of file system design, communications and time sharing.

The dimensions of batch processing, remote access processing, transaction processing, and time sharing are integrated, thus providing a level of effectiveness beyond that attainable with multiple-system installations.

This merging of processing dimensions in concurrent operation permits the tailoring of the processing mix to individual installation requirements, including dynamic variation throughout the processing day.

Data base management efficiency

The organization, processing, and timely availability of data affecting the state of your business are obviously of first priority. All else—hardware, software, programming languages—supports the need to get at and use such data.

For a fast-growing number of companies today, this means one central information source available to every part of the organization. A common data base lets you define real-world situations and relationships as they occur. It also eliminates redundancies.

Honeywell makes all this possible with a powerful data base management capability. And it provides these benefits without loss of confidentiality or security.

Series 60 offers enhanced capabilities for assembling larger data bases, sharing files, and modifying existing data bases more readily. Honeywell is also playing a leading role in helping to establish industry standards for data base management.

Transaction processing convenience

Transaction processing offers the convenience of online data processing to a wide range of industries such as banking, health care, insurance, brokerage, distribution, government, transportation and manufacturing.

It's a technique that gets the computer involved in mainstream operations as they occur by allowing the processing, filing, or reference of up-to-date information from online communication terminals. The transaction processing terminals are used by sales clerks, bank tellers, factory workers, and others as a regular part of their job.

Honeywell's Series 60 with its GCOS transaction processing capability for larger users makes online transaction processing practical for many companies where before the complexity and cost of such systems were prohibitive.

To simplify system use, only data is entered at the terminal. Terminal users do not enter a program, control cards, or even program control statements. They don't even need to know that computer programs exist. For example, when a bank's customer makes a deposit, the teller immediately enters a transaction describing the deposit. The customer's bank record is updated right at the teller window.

Data communications to unify your business.

The Honeywell Information System is by definition an integral and vital part of a business operation—the channel for timely information flow and processing to aid decision making.

Therefore, Honeywell has placed special emphasis on data communications, developing efficient ways to distribute information throughout your company...including to and from remote locations such as branch offices, warehouses, and factories.

We call this highly refined technique "information networking." It can be a key to giving your business the timely intelligence and response capability needed to react to business changes and opportunities. Information networking can help you improve your customer service, tighten up your inventory, get faster financial information, spot developing business trends faster and more accurately.

In short, information networking can provide the information to improve management effectiveness and increase your company's ability to compete in a very competitive world.

How we help you build this capability

Larger Series 60 systems have been designed to permit the sharing of a common data base, as well as the sharing of peripheral resources, by multiple

processors. This capability means increased flexibility and efficiency in information networking operations.

Our DATANET front-end network processors handle communications without tying up the host central processor. (Honeywell has been an industry leader with this approach.) And our DATANET remote network processor performs chores such as remote job entry, remote batch processing, and line concentration to further improve data handling and reduce data transmission costs.

Our new integrated communications processors offer small- and medium-system users an advanced and powerful entry into data communications at a low cost. They can handle multiple lines and support a wide range of terminals.

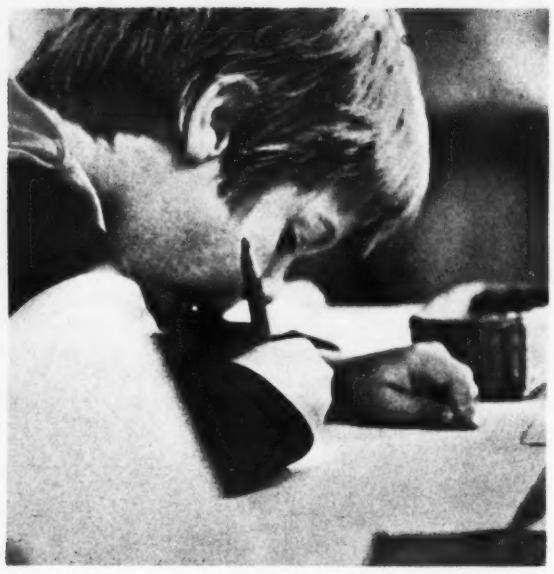
Our Network Processing Supervisor (NPS) has established a new industry standard for data communications efficiency and control. NPS software supports not only transaction processing, but also all other modes of remote access: remote batch, time sharing, direct program access, data allocation and distribution, plus store-and-forward message switching.

Advanced NPS features include data and system integrity protection, including error detection/correction, automatic restart/recovery and support of fail-soft operation in a dual configuration. Supervisory control functions monitor events in the network and exert control over these events when necessary. Statistical recording and reporting features provide detailed and summary information reflecting network operation, and customization features meet individual network requirements.

Our terminals provide additional efficiencies in line utilization to further reduce communications costs. This they achieve by means of built-in microprocessor controllers plus highly sophisticated control disciplines. Other advantages provided by these new terminals include connection flexibility and ease of operation.

The model 64/20 offers a new level of performance for medium-scale users.
It includes a compatibility mode for easy transition from Honeywell Series 200/2000 systems.

Major help for key industry specific needs.



The Honeywell Information System includes an extensive library of application software—system designs and modular, precoded packages specific to your industry. Whether installed as supplied or modified prior to use, they help produce quick business results, keeping your development costs down and increasing the return on your investment.

Manufacturing: Honeywell's Factor, a management information system for manufacturers, includes critical applications such as Bill of Materials Processor, Inventory Management, Material Requirements Planning, Production Scheduling and Control, Purchasing Management, Numerical Control, and Management Science techniques. Many of these tools can be efficiently brought together in a data base environment for increased control and productivity.

Education: Honeywell offers application programs in the areas of both administration (SCRIBE) and instruction (EDINET). SCRIBE programs handle tasks such as Attendance Accounting, Grade Reporting, and Class Scheduling. EDINET programs range from Resource Retrieval to Individualized Math Instruction and College Selection. Honeywell time sharing capabilities, running under the control of either GCOS or the Dartmouth Time Sharing System, are popular with both schools and colleges.

Banking: Honeywell supports a full array of banking peripherals and terminals, including extensive MICR capabilities and a high-performance teller terminal. Honeywell banking packages plus data communications and Central Information File (CIF) capabilities can dramatically increase a bank's information processing and customer service capacity.

Distribution: Honeywell's MI·DIS is a system design for total control of all distribution functions, including Order Processing, Inventory Management, Vehicle Scheduling, Sales Analysis and Financial Management.

Health Care: Honeywell is deeply involved in and committed to the health care industry. Capabilities range from Patient Accounting and Hospital Financial Management to Clinical Laboratory, Catheterization Laboratory, and Intrahospital Communications applications.

Government: A large selection of customer-developed applications are available. For states, they include Employment Security Processing, Social Services, Revenue System, Motor Vehicle Registration, Driver's Licenses, Liquor Store Control, and Legislative System. And for cities or counties, applications range from Utility Accounting to Revenue Collection and Law Enforcement.

That's The Honeywell Information System story... The Pride of Honeywell... and yet it's only the beginning. We'd like to tell you a lot more. So why not call our local sales office. Or check the reader service card. Or drop us a note. Honeywell Information Systems (MS 061), 200 Smith Street, Waltham, Massachusetts 02154.

The Other Computer Company:

Honeywell

The Pride of Honeywell.

Law Restricts Collection, Dissemination

Minn. Government Data Tightly Reined

By Nancy French
Of the CW Staff

ST. PAUL, Minn. – The State of Minnesota has passed into law one of the most comprehensive bills any state has yet enacted to control the collection, security and dissemination of computer-based records and information in state government and local governing bodies within the state.

The legislature is expected to pass another law next year to deal with data banks in use in the private sector, according to Daniel B. Magraw, assistant commissioner of administration here.

The writers of the present law felt it was most important to "get the government house in order first before going after the private sector," he added.

The act covers three general aspects of privacy/security.

First, it assigns responsibility for controlling the collection and use of data to the commissioner of administration; it outlines the rights of the individual who is the subject of the data collected; and it sets penalties for violations of the statute.

Commissioner's Task

Called the "Minnesota Data Security and Privacy Law," the act requires the commissioner to limit data collection to "that necessary for administration and management of programs enacted by the legislature or local governing body."

To insure compliance, the statute requires each individual in charge of a data collection system to inform the commissioner of the nature of all data on individuals collected and stored, and the need for and the intended use of the data.

It further requires that all requests for use of the data by persons other than the original collector be submitted in writing and be entered into the public record.

Permission will then be granted only when required by law or where clearly necessary to the health, safety or welfare of the public, if to do so would be clearly in the interest of the individual involved.

The law provides that summary data – data without accompanying names – may not be used without obtaining a written authorization specifying limitations on intended use.

The law requires that "reasonable and appropriate safeguards" be established to assure the stored data is accurate, complete and current, but leaves up to the commissioner decisions as to what is "reasonable and appropriate." And finally, data on individuals shall be stored "only so long as it is necessary to the administration of authorized programs or as authorized by statute."

Individuals' Rights

Individuals' rights under the law provide that an individual asked to supply personal data shall be informed of the purpose of its intended use and whether or not he may refuse to supply that information. He also shall be informed of any known consequences arising from supplying or refusing to supply the personal data.

In addition, data collected for one purpose can be used for another purpose only after the user notifies the commissioner of his intentions and his purpose.

Any citizen of the state may request the commissioner to inform him whether he is the subject of stored data and, if so, upon his additional request, he shall be informed of the content and meaning of the data or shown the data without charge to him.

Data found to be incorrect must be corrected within 30 days. In addition, the user must attempt to notify past recipients of the inaccurate or incomplete data or notify "the individual in question that the records have been corrected."

The person who willfully violates any provision is guilty of a misdemeanor and any public employee who willfully violates the law may be suspended without pay or discharged after a hearing.

The person who suffers damage as a result of a violation may bring an action against the political subdivision or "other responsible authority" to cover any damages sustained, plus costs and reasonable attorney fees.

In the case of a willful violation, the violator shall, in addition, be liable to exemplary damages of not less than $100 nor more than $1,000 for each violation.

Finally, on or before Dec. 1 of each year, the state commissioner of administration must notify the legislature in writing that these conditions are being fulfilled.

Exempt from the law are intelligence files, maintained by police departments on individuals under surveillance for possible future investigation, and records kept by state health and mental hospitals – the latter on the grounds that for some, knowledge of the contents of these health and mental files would cause more harm than good.

More Intrigue Surrounds 370 Takeover in Oregon

By Robert L. Glass
Special to Computerworld

SALEM, Ore. – The name of Duane Wolf of Oregon's Legislative Fiscal Office (LFO) appears at least twice in an in-depth review of the commandeering of the state of Oregon's Department of Motor Vehicles (DMV) computer [CW, April 24].

Someone called the DMV computer center the afternoon of the takeover and, using Duane Wolf's name, asked that the TSO time-sharing system be left on the IBM 370/158 beyond its normal late afternoon shutdown time.

At 11 p.m., Bill Fellinger of the Oregon Department of Higher Education (ODHE) network planning team logged on the system and took it over to demonstrate that the computer and its operating system were not secure for student usage.

And, during his session on the computer, Fellinger sent a message to the operator's console saying, "This crash is brought to you by ODHE. Tell Duane Wolf – Legislative Fiscal Office."

Wolf, a computing specialist in the LFO office, professes ignorance. "I never met Bill Fellinger before the incident," he said, "except when we were both present at hearings to review an ODHE network computing plan."

The plan was disapproved. Fellinger feels that LFO thwarted the ODHE plan because of partiality to IBM. "No way," Wolf replied. The state Data Processing Commission which reviewed the plan is basically a conservative body, with very little knowledge of data processing, according to Wolf. The ODHE presentation was highly technical, Wolf said, and the application questions which were of more interest to the commission were not covered in ODHE's presentation.

IBM Main Vendor

Wolf elaborated on the question of IBM partiality in the State of Oregon. Statutes require competitive bidding in Oregon, and there are several vendors with equipment installed, he said. But the majority of the large equipment is IBM's, he went on.

There are reasons:

- It is difficult to switch from existing IBM equipment to other vendors because of software conversion costs.
- Other vendors tend not to bid on Oregon contracts.
- IBM is the only company with a support office in Salem.
- The Federal Government, while professing impartiality, requires the capability to run certain kinds of software (e.g., welfare programs) which are available only from IBM.

The support issue is especially important to Oregon officials. A vendor of remote job entry hardware which closed its Salem office six months ago found all of its systems returned shortly afterwards.

Competition is also important, Wolf noted. The State of Oregon, which had a surplus DMV IBM 360/40 it wanted to place in its Human Resources consolidated center two years ago, opened the placement to competition. (Eventually the state won.)

Announcing--

COMPUTER-BASED TEXT PROCESSING AND COMPOSITION

May 15-17, 1974
Hotels Ambassador, Chicago Illinois

Presenting Case Studies and reports reviewing the details on new developments in computer-based publishing systems. Case studies include:

West Publishing Company
Chemical Abstracts Service
Economist Newspapers
Christian Science Monitor
Triangle Publications, Inc., Daily Racing Form
International Computaprint Corporation
Electronic Keyboarding, Inc.
Composition Technology, Inc.
Graphic Arts Data Service, Inc.
Canadian Government Printing Operations

plus reports on data base design concepts, job and financial printing, and "ELECTRONIC COMPOSITION COST COMPARISON REVISITED" by E.R. Lannon, author of the landmark 1970 Report on CRT typesetting: "Electronic Composition Cost Comparison"

a 1974 CONFERENCE program of the
GRAPHIC COMMUNICATIONS COMPUTER ASSOCIATION
a Section of Printing Industries of America, Inc.

Other Conference programs cover Computer-based Printing Management Systems, Mailing List Services and Distribution System Developments, and a tutorial, Fundamentals of Mailing List Computerization. For full information call or write Norman W. Scharpf, GCCA/PIA Executive Director, 1730 North Lynn Street, Arlington, Virginia 22209, area code (703) 527-6000.

Fourth Annual Institute in Computer Science

ON THE SANTA CRUZ CAMPUS OF THE UNIVERSITY OF CALIFORNIA
July-August 1974

Ten intensive computer short courses presented by an outstanding faculty under the technical coordination of Dr. William McKeeman, Associate Professor of Information Sciences, UCSC. A program with courses for both the computer professional and others with little or no background in the computer field.

For the computer professional

Discrete Systems Simulation Using GPSS (Introductory/Intermediate Section)
Dr. Thomas Schriber. July 8-12. $325.

Discrete Systems Simulation Using GPSS (Advanced Section)
Dr. Thomas Schriber. July 15-19. $325.

Technical Methods for Computer Privacy and Security
Dr. Lance Hoffman. July 22-26. $325.

Data Base Management
Dr. Eugene Lowenthal. July 29-August 2. $325.

Compiler Construction
Dr. Franklin DeRemer and Dr. William McKeeman. July 29-August 9. $485.

Operating Systems
Dr. Nico Haberman. August 12-23. $485

Advanced (Structured) Programming
Dr. David Gries. August 12-23. $485.

For others who use computers in their work

Using Minicomputers
Dr. Udo Pooch. July 15-26. $485.

SPSS Statistical Packages
Mr. Dennie Van Tassel. August 5-9. $325.

BMD Statistical Packages
Mr. Dennie Van Tassel. August 12-14. $195.

Housing and meals are available on campus for participants and families (children under six are not permitted to stay in University residence halls).

For additional information

Mail to: **Institute in Computer Science**
University of California Extension
Santa Cruz, California 95064

Name _____

Address _____
street

_____
city state zip

Implementing Information Privacy

Security Study Distills 10 Action Steps for Executives

By E. Drake Lundell Jr.
Of the CW Staff

SPRINGFIELD, Ill. – "Like all organizational objectives, information privacy cannot be achieved without the commitment of top management to a well-defined plan of action supported by appropriate resources."

Accordingly, the Illinois Secure Automated Facility Environment (Safe) project – which was one of four major sites for an IBM-sponsored study of security in data processing systems [CW, April 24] – has suggested 10 "Action Steps" for use by top-level executives in implementing information privacy in their organizations.

Information privacy, the report noted, "is an interdisciplinary problem. It involves the awareness and understanding of existing and pending legislation, as well as the use of available technological and administrative safeguards.

Educate First

"But, a basic underlayment of any plan is the ability to educate information system managers and users to the need for careful handling of information," the Safe project said.

At the same time, the group noted that security and privacy matters were "organization-dependent," maintaining that its program of Action Steps was aimed at providing a checklist of actions for top managers in order to fulfill their responsibilities in the area.

First, the report said, top managers should review all information system requirements and try to limit the amount of data collected to what is needed – and all new uses of data or plans to collect data should be cleared through the top executives, the report said.

The second step involves the analysis of the confidentiality and criticality of information and then the establishment of guidelines to assess the value of information and the founding of a classification structure for all data.

After these classifications are established, the manager can then assess the vulnerabilities and risks to data within the system including tradeoffs between increased security and increased cost.

The next step in the action program would then be an investigation of the technological safeguards that are available to help make vulnerable areas more secure.

The information executive should be able to tell top managers both the cost and the effectiveness of available technological safeguards, according to the report.

Budget Time

The next action step would be to develop a budget for information privacy, the report said, noting that "the inconvenience costs to users during the implementation of an information system privacy program can be substantial."

Step six in the plan would be to organize for information privacy by assigning specific people or groups the responsibility for various aspects of the problem, including classifying information, researching the technology, executing audits, and investigating security and privacy breaches and enforcing policy and procedures.

Next, there is a need to establish individual accountability, the report said, including developing a security profile for each information system, defining who can read, change or update any information within the system.

The eighth step in the plan calls for implementing the security safeguards, with the report noting that often organizations end up with impressive plans for information privacy, but little real implementation of those plans.

"Senior management must recognize that more than superficial measures are necessary," Safe said. "It takes the timely application of needed resources."

Top managers also must help create a "privacy-conscious environment," the report said, and must condition the people working with such systems to be aware of their responsibilities to keep material private.

"Effective policy execution is dependent on the success of your organization's education program," the report said.

Heightened Awareness

"The objectives of this program must range from heightening the awareness of all employees to the importance of information privacy to defining the technical details of computer security for the information technologist," it added.

The final step in the plan involves periodic auditing of the security procedures and optimizing the performance of the total security system.

"The auditing process can be envisioned as closing the circle of activities that are necessary for a security- and privacy-conscious environment," the report said, noting that audits should cover all of the organization's activities in the privacy and security area.

New Line of 'Microperipherals'

Microprocessors One Step Closer to Business DP Use

By Ronald A. Frank
Of the CW Staff

WOODLAND HILLS, Calif. – The microprocessor has come a step closer to the business DP user with the announcement of a line of "microperipherals" for the computer-on-a-chip systems.

The new microperipheral I/O devices will be hardware- and software-compatible with the microprocessor systems available from such semiconductor firms as Intel and National Semiconductor.

Despite their adaptability to user applications, few users have thus far implemented the microprocessor systems. It is expected that initially the microprocessors operating in end-user environments will be limited to scientific applications and process control.

Like The Mini

But industry experts point out that the minicomputer was utilized in scientific areas long before it became part of the business DP repertoire.

The first microperipheral is a paper tape reader that can interface to the Intel Intellec series of 4-bit and 8-bit microprocessor systems. The paper tape reader will cost $995 and will interface directly with the I/O boards of the Intellec systems. It will be supplied by iCom, Inc., a firm formed to provide a full line of microperipherals, according to a company spokesman.

OEM Until Now

Until now, the systems have been mainly restricted to use by OEM users, many of whom utilized them to develop experimental dedicated applications systems. As an aid to OEM developers, Intel last year introduced a microprocessor system including I/O interface, 16K bytes of Prom, 4K bytes of Ram, chassis, power supply, operator console and software.

This Intellec system costs about $2,395, according to one semiconductor expert, and both 4-bit and 8-bit processors are available. Later National Semiconductor introduced a similar 16-bit system, called Imp, for about $3,800.

Reguirements Differ

But these microprocessor systems exist in a very nonstandard environment. Both hardware and software requirements differ from supplier to supplier and iCom will have to provide specific interfacing and software for each type of system. Because Intel is the largest supplier, the first microperipherals will be compatible with the Intellec series, an iCom spokesman said.

The main difference between these microprocessor systems and the microsystems now available from some minicomputer suppliers is the support provided. The microprocessors originate from semiconductor suppliers who are mainly chip vendors and offer no customer support. On the other hand, the microsystems available from DP vendors usually include a level of hardware and software support in addition to compatible peripherals.

Line Printer On tape

The iCom paper tape reader will operate at 80 char./sec using a photoelectric reader. It will be followed in about "six to 10 weeks" by a high-speed punch and shortly after that a line printer will be introduced.

The first units will include their own power supplies and will interface with the ribbon cables on the Intellec I/O boards. Later, iCom will develop a compatible floppy disk operating system and the available microperipherals will be interfaced to other lines of microprocessor systems, the firm said.

50% Savings

While direct comparisons between the microprocessor systems and existing computers are difficult, one source estimated that with the microperipherals, the new systems would have "slightly less performance than available minicomputers with about a 50% savings." Undoubtedly a significant portion of this savings will have to be allocated to software development and other systems work by the user. Among the most logical applications, multiprocessor systems, communications control, process control and similar dedicated uses will probably be developed, experts believe.

Special Architects

The microprocessor systems may see the emergence of special system architects who will perform this development work, according to Ted Withington of Arthur D. Little. It is expected that the more sophisticated users will be the first to utilize the microprocessor systems at their DP sites, he predicted. Beyond that, microprocessor systems could come into widespread use the same way that minicomputers have evolved.

Meanwhile, iCom calls itself the first microperipherals supplier. And if it has correctly identified a need, other firms will undoubtedly follow. The company is at 21243 Ventura Blvd. 91364.

ADDS KEYBATCH™...

The Data Entry/Remote Batch System with exclusive editing capabilities

Now you can key your data directly into a versatile DATA 100 high speed intelligent batch terminal. Keybatch provides comprehensive editing and storage of up to five million bytes of data at its source. DATA 100 communications capabilities will allow Keybatch to operate with all major main frames with no software modifications. Keybatch is another reason why more users are looking to DATA 100 for the latest, most versatile remote data processing systems.

Sales and Service available in North America, Western Europe, Australia and the Far East.

■ Local and Remote Key Stations ■ Communications with All Major Central Processors ■ Concurrent Batch and Data Entry Operation ■ Wide Range of Editing Features ■ Disc Storage to 5 Million Bytes ■ Up to 9 Operator Stations ■ Plus Powerful Batch Processing Capabilities

DATA 100 CORPORATION

Post Office Box 1222, Minneapolis, Minnesota 55440 • 612/941-6500

Epoch 4:
Worth its weight in gold.

When you commit your company's data to computer tape, you invest hours of costly computer time — plus valuable information.

But, most of all, you commit your company's money.

That's what makes Epoch 4 such a solid investment.

Because it's 8000% tougher than any other tape, and 100% certified, you know your data will be there when you need it.

And, when you consider the 20-year warranty, Epoch 4 is probably the least expensive computer tape on the market — about 6 cents a month per reel.

Epoch 4. It's as good as investing in gold. Maybe even better.

Epoch 4: A Solid-Gold Investment.

GRAHAM MAGNETICS

Graham, Texas 76046

Plans for Joint, Open Meetings Under Way

Sharing — That's the Watchword for CPE Groups Now

By Don Leavitt
Of the CW Staff

"Anyone who has anything to say or learn about the means of measuring, analyzing, predicting or simulating the performance of a computer system is invited."

Those words came from the chairman of the Computer Performance Evaluation Users Group (CPEUG), talking about the group's meeting in Atlanta later this month, but they easily might have come from the leadership of various other groups concerned with computer performance.

The CPE groups are clearly leading the movement to make DP centers more efficient, and they have abandoned their old ways – and their closed doors – as they have reached toward fuller sharing of experiences. The sharing idea has also prompted one specialty publication to devote part of its space to an exchange of ideas and experiences.

In related interest areas, BBUG, a group once tied to the CPE products of Boole & Babbage, moved away from that vendor a year and a half ago to broaden the scope of its meetings. Now it has gone even further. The BBUG leadership has announced plans for both concurrent and joint meetings with Sigmetrics, an ACM special interest group, when they both meet in Montreal this autumn.

Not quite as adventurous, a Comress users group is planning to meet in Atlanta at the end of May. For a time, it considered shifting its timetable a week in order to dovetail with CPEUG. That idea was dropped, however, since CPEUG won't adjourn until noon on a Thursday, and the Comress group already has a full two-day program planned.

CPEUG's open invitation is particularly impressive in view of the group's start in 1971 as a small meeting of Air Force personnel working with Comet, a government version of Scert, the Comress simulation package.

The group expanded into a government-wide body, especially after the National Bureau of Standards set up Federal Information Processing Standards Task Group 10 to consider CPE problems. CPEUG is currently a direct subsidiary operation of TG 10.

CPE vendors and government contractors have been admitted to CPEUG's semi-annual meetings for several years, but last December's conference in Washington was apparently the first to admit a CPE technician from a completely non-government installation.

There will be a $10 registration fee for the CPEUG meeting, now set for May 21-23, but no membership fee since the organization has no activities except the meetings and no real administrative overhead.

Differences Still Apparent

The BBUG-Sigmetrics venture shows both the interest in sharing experiences among CPE groups and the differences that still exist in approach to the subject. Sigmetrics has issued a formal "call for papers" and a schedule of refereeing and resubmission of accepted papers prior to the late September-early October meeting.

BBUG, on the other hand, has sent out a questionnaire to its members asking what they would like to have in their formal technical sessions, which will be separate from the Sigmetrics formal meetings.

Although face-to-face meetings are useful, times and places are not always convenient, so to bring together users' CPE problems and, hopefully, solutions, the monthly newsletter *EDP Performance Review* has now opened its columns to case studies and related user-provided material.

The newsletter is edited by Philip Howard and published by Applied Computer Research, Suite 298, 8808 N. Central Ave., Phoenix, Ariz. 85020.

CPEUG Chairman William Letendre can be reached at Headquarters, Electronic Systems Division, Hanscom Field, Bedford, Mass., and BBUG President Barry Stevens is with Allied Chemical, P.O. Box 1039-R, Morristown, N.J. 07920.

Chairman of the Sigmetrics technical program for Montreal is John Howard, Department of Computer Sciences, University of Texas, Austin, Texas 78712.

TWA Cardholders Get More Than Plane Trip

By a CW Staff Writer

NORTH HOLLYWOOD, Calif. – People who sign up for TWA Getaway Cards "become eligible for many other offers," according to Bob Mosher, manager of credit marketing for Trans World Airlines, and that is how TWA gets around the touchy issue of selling its computerized mailing list of 500,000 Getaway Card holders.

The actual marketing job for the credit card list is handled by the Market Compilation and Research Bureau (MCRB), a division of Dart Industries, Inc., here.

The only indication cardholders receive that their names will be sold is the quote, TWA Getaway Card holders "become eligible for many other offers."

In its nationally distributed sales literature, Dart characterized TWA cardholders as "people with better incomes, people on the move" . . . members of "the most dynamic segment of the American population."

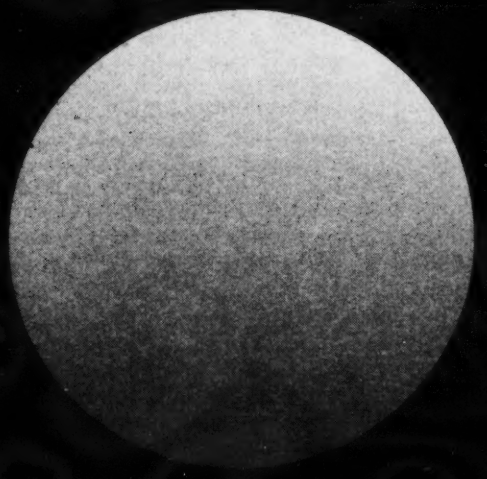
Dart literature suggests that companies selling land investment, sporting goods, clothing, records/tapes, books and magazines can sell successfully to TWA travelers.

Under "general conditions for use of this list," MCRB specified that as far as "ownership of names addressed" is concerned, all lists furnished by MCRB are released on a rental basis for one-time use only and may not be duplicated.

Its only restriction on those companies which wish to pack the mailboxes of TWA cardholders is as follows: "MCRB reserves the right to request a sample mailing piece or proposed copy before agreeing to release any of its lists. All first-time orders must be accompanied by a sample of the mailing piece."

MCRB explained, however, that these controls are required "to avoid conflicts in scheduling and to allow screening of material that may be misleading or in poor taste . . . "

Designing and delivering for the future today...



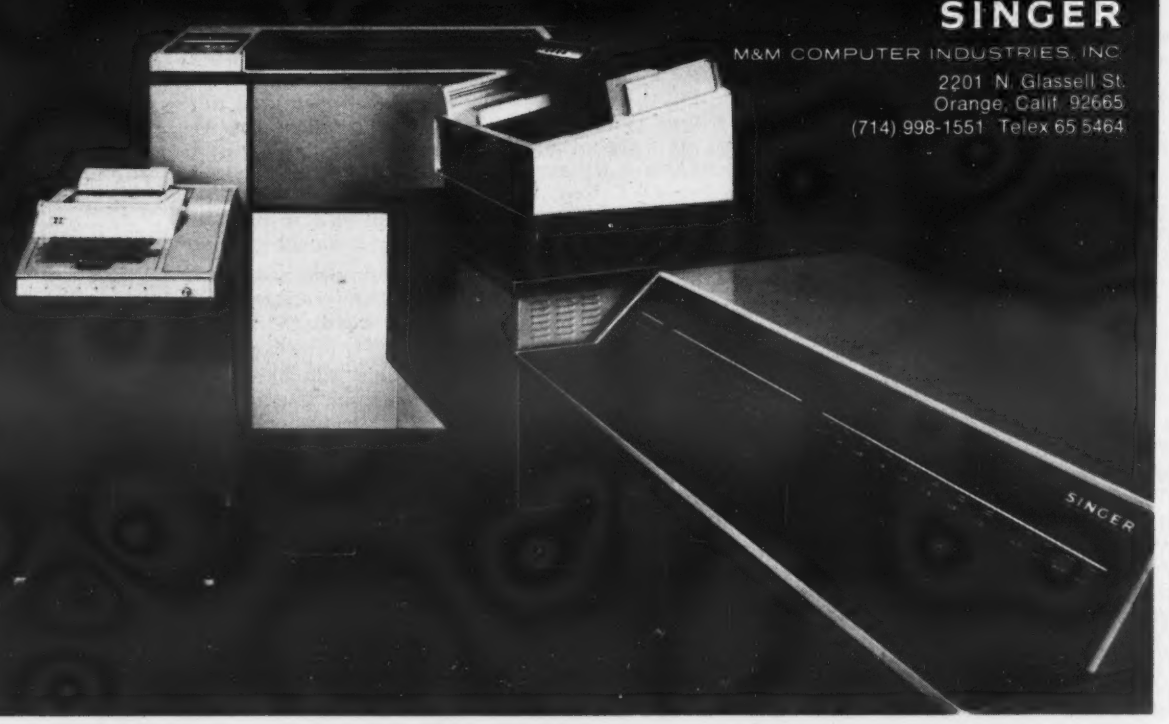
Singer-M&M Intelligent Remote Batch Terminal Systems are communicating worldwide with all the major mainframes at speeds up to 50.kbps., processing jobs limited only by your imagination. IBM, CDC, UNIVAC, Burroughs, Honeywell . . . they're all transparent to us.

When you consider price/performance, the chart below quickly shows that basic Singer-M&M Remote Batch Terminal Systems deliver more for the money than any other equipment now on the market.

BASIC SYSTEMS	520*	580*	565*	560*
Card Reader				
300 cpm	x	x	x	
600 cpm				x
Line Printer				
200 lpm	x			
400 lpm		x	x	
600 lpm				x
Communications				
2 to 4.8 kbps	x			
2 to 7.2 kbps		x	x	
2 to 50 kbps				x
Keyboard Console	Opt	Opt	Std	Std
Multileaving HASP Work Station	N.A	N.A	Std	Std
Monthly Rental Including Maintenance	$675	$940	$1160	$1645

*Optional Peripherals available.

Add to all this the name SINGER with worldwide sales and service and you now have the versatility, price/performance, reliability and intelligence to specify a remote batch system. Call today for a demonstration of what Singer-M&M is doing for you.



SINGER
M&M COMPUTER INDUSTRIES, INC.
2201 N. Glassell St.
Orange, Calif. 92665
(714) 998-1551 Telex 65 5464

Editorial

Right Road, Wrong Direction

There appears to be some movement under way in the U.S. Government-IBM antitrust case, but it is in the wrong direction.

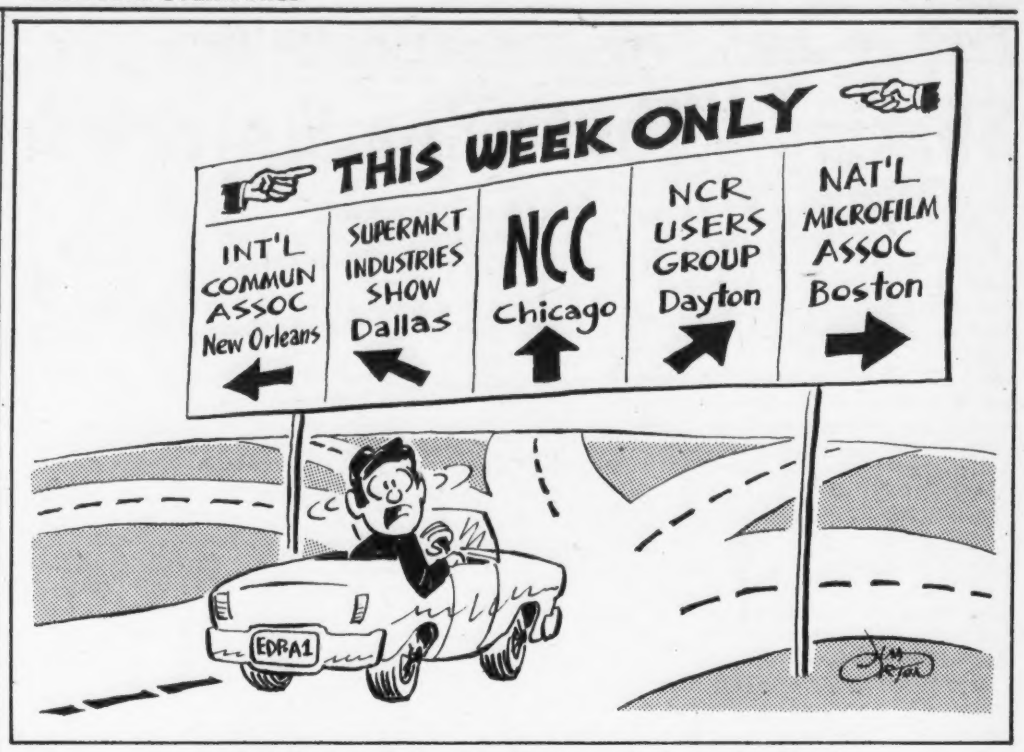
Several news items recently have pointed to problems in the case that might serve to delay its scheduled start on Oct. 7 of this year – a delay that should be intolerable.

The case will be almost six years old at the proposed trial date – certainly enough time for the lawyers and parties on both sides to have narrowed the issues in the case and completed the pretrial groundwork.

Judge David N. Edelstein has taken a forthright position on the issue by indicating he will "resist" any move for a further delay – a stand that is to be congratulated.

Both sides are to blame for the excessively long time the case has been under consideration and it is now time for both to get down to the hard work in the months ahead so there will be no future delay, since any delay causes havoc with users' purchasing plans and the economic state of the industry.

This most important legal issue must be resolved as early as possible.



'I Thought I Left the Big Decisions Back at the Shop'

Letters to the Editor

Lack of Right Port Can Be Remedied

The article on IBM front ends [CW, March 13] cites Dr. David Mills' proposition that the vendor is uncooperative in facilitating connection of better terminals. That is, terminals with better performance supplied by competing vendors.

While this has been our experience also, the specific example given, lack of an RFP for a 300 bit/sec 2701 port, can be remedied as follows:

- Install standard 2701 telegraph II adapter.
- Install RPQ F 26674 VER049 (AT&T Model 37 TTY interface).
- Replace card 5807058 (9.6 KHZ oscillator) at location K2 with card 5801784 (19.2 KHZ oscillator).

While this is an unsupported modification, we used it sucessfully when we had a 2701 to interface Datacom 300 (Terminet 300) terminals; presumably the remedy for 2702 and 2703 ports is analogous.

William L. Birney
Technical Services Supervisor
British Columbia Telephone Co.
Vancouver, Canada

Hats Off to OCR User With Working System

Re "OCR (A Bit Frightening) [CW, April 24]:

The title really doesn't agree with the content of the article. Congratulations to the Blue Cross/Blue Shield team are in order by another OCR user for a potential savings of $200,000 plus in a two-year period via OCR.

We have been involved in OCR for approximately 10 years and have approximately 275 varied OCR applications in operation at our Delran, N.J., data center. Our EDP facility services 25 subsidiaries of the corporation and a number of customers outside the corporation, all of which utilize our OCR capabilities in one fashion or another. The savings realized by our firm over the past 10 years are immeasurable. Yes, we too have made mistakes, but so has everyone involved in various phases of data processing.

Existing and potential OCR users should be members of the OCR Users Association which is a fine organization oriented toward improving the art of OCR. The next Ocrua conference will be held in San Francisco on July 9-12, where user ideas will be exchanged by all members in attendance. The last conference, held in December 1973, had over 200 attendees.

W.A. Dwyer
Mgr. EDP Services
Macmillan, Inc.
Delran, N.J.

Apathy Understandable

The recent survey by Alan Taylor on dirty files was very interesting because, like all DP managers, I believe we strive to keep our data files "clean." In today's world of various shortages, it is important to cut the "chaff from the wheat." I have attempted to do so with the various "junk mail" I receive.

Recently I sent a letter to the American Management Association (with mailing labels attached), requesting it to reduce my mailings from three to one. Their reply states: "Unfortunately, at this point in time, the elimination of duplication among business lists is just not economically feasible." Now I can understand the apathy many users have of data processing.

Dennis P. Full
Manager of Information Services
Lenox Candles, Inc.
Oshkosh, Wis.

Throw Out Bad Tickets

I was startled by the story in the April 17 issue about the disappearing ink on the carbon copy of parking tickets used in the District of Columbia. You will recall that the tickets were printed on a rubbery paper that was very strong – but the ink used to print the serial number and the carbon used when filling in the variable information tended to rub off.

The article concluded that the next batch of tickets will be different – but it didn't indicate that anyone had the sense to throw out the entire batch on hand and replace them immediately.

If the information in the article is correct that one million tickets cost $30,000 or 3 cents apiece, then the additional work to handle tickets with no information on them would have to be less than 3 cents apiece to warrant using up the present supply rather than immediately replacing them.

At $2 an hour minimum wage, this means that less than one minute extra per ticket must be spent. The article implied that much more time was being spent – and, therefore, the prudent decision would be to reorder immediately and throw out the defective tickets as an economy.

Robert Kahn
Lafayette, Calif.

Cashless Society Ideal

In regard to the article on home terminals [CW, April 24], I feel it is only a matter of time before the IRS realizes that a cashless society with the government responsible for all transfers, i.e., the government runs the computer, is the ideal way for collecting taxes and controlling money crimes.

Who's to say if this system would be good or not? At least we would not have to compute income tax. It would be built into the program and there could be no cheating. We wouldn't be able to pad expense accounts either.

Banks would still have their present functions. It does seem that such a system would stymie crimes involving transfer of money or funds. How could one pay for drugs? How could one gamble without it being known? What good would it be to hold up a bank or a person?

The economies sayers would be pleased as the systems would give them a running total of the GNP and other factors.

Walter Meuller
Indianapolis, Ind.

Addresses Needed

With regard to the special report on data base management systems [CW, Feb. 27], I am interested in communicating with vendors listed in an article by Harold Uhrbach entitled "Dictionary Links Data to Uses." However, I have been unsuccessful in finding some of their addresses. Specifically, these are: Arthur Anderson; Eastern Air Lines; Logica, Inc.; and Software Unlimited.

Steve Sabin
Columbia, S.C.

As follows: Arthur Andersen, 1345 Avenue of the Americas, New York, N.Y. 10019 – Lexicon; Eastern Airlines, International Airport, Miami, Fla. 33148 – Data Base Directory (DBD); IBM, 1000 Westchester Ave., White Plains, N.Y. 10604 – Data Dictionary/Directory (DD/DS); Logica, Inc., 931 S. Douglas St., El Segundo, Calif. 90245 – Logic Metadata System (LMS); Software Unlimited, 63-84 Saunders St., Rego Park, N.Y. 11374 – Commandd; Synergetics Inc., 1 Garfield Circle, Burlington, Mass. 01803 – The Data Catalogue; University Computing Co., Dallas, Texas – UCC – Ten.

Arpa Net Not a Toy

I do not completely understand the intent of your recent editorial [CW, April 17]. However, if you by your editorial mean to imply that Arpanet is a useless "toy" or that a minicomputer is not capable of *far better* cost/performance ratios than your "respectable" 370/145, then, you, sir, are very, very wrong.

Gordon E. Peterson II
Champaign, Ill.

The Arpanet is an intentional and shameful ripoff of the taxpayer by a military-academic clique, a clique that should be impeached. It carries no useful traffic. It costs the earth. And as a demonstration, well, the intercontinental S.I.T.A. network of disparate computers and different-bandwidth links was a working reality before Larry Roberts passed out the first boodle to his eager pals. HG

He Has No Patience

As I read Herb Grosch's editorials in *Computerworld*, I often suspect he has something to say. Unfortunately, he has a unique ability for obscuring the message.

The editorials seem to encircle the subject with so much gobbledygook, without getting to the point. I don't have the time to reread the writing three or four times to try and figure out what he is trying to say, nor do I have the patience to try and read between the lines.

Some people may think it is cute; I think it is foolish. If Grosch wants to have an impact and get his point across, may I suggest that he alter his writing style to be more direct. At least he should have the courtesy to state his point explicitly. Perhaps then we will understand him better.

Gordon C. Everest
Minneapolis, Minn.

Good Riddance to CPP

The April 17 editorial praises the Computer Professionals for Peace organization . . .

It is doubtful that the CPP as an organization has made any significant, positive contribution to the computing field or the nation's well-being. Praise, rather, the death of CPP; it has come to the end all fascist-minded groups deserve.

P. Chinitz
Norristown, Pa.

"When I use a word," Humpty Dumpty said, in rather a scornful tone, "it means just what I choose it to mean – neither more nor less." HG

Computerworld welcomes comments from its readers. Preference will be given to letters of 150 words or less. Letters should be addressed to: Editor, Computerworld, 797 Washington St., Newton, Mass. 02160.

By What Standards Do We Judge Them?

At Last...a Few Good Words on Private DP Schools!

By Joseph T. Rigo
Special to Computerworld

I would like to put in a few good words for private EDP schools.

These schools are constantly under attack. Some for good reason. Some for reasons not so good.

I think we can agree on a few things:

- They do not appeal to the better class of people. They simply do not attract students who are able to win full tuition scholarships to major in computer science at Harvard, MIT or Stanford.
- They generally do not turn out our most distinguished computer professionals. Some of their graduates actually have to settle for taking jobs as (shudder!) computer operators.
- They accept students who can't do the work, and who have high dropout rates. Would anyone like to try naming a school where this isn't true?
- They have been around for a while. Maybe it's time to consider the possibility that they really are filling an honest role in our great scheme.

The professional academics have been firing potshots at the private schools for years. God forbid that anyone should get a job in computing without spending at least two years sleeping through endless lectures on Boolean algebra.

Now the public press is entering the act. As reported in *Computerworld*, the *Boston Globe* had one of its reporters take the entrance exam for a private EDP school.

The reporter deliberately messed up several of his answers, scoring only 54% on the exam. (In a CW cartoon one week later, this was reduced to 32%.).

Despite the score, a school salesman told the reporter, "I'm sure you can do the work here." This quote was cited as evidence of the school's evil intentions.

Now the *Globe*, despite its dullness, is still able to attract reporters who can read and write. They tend to be college graduates, white, middle class and articulate.

In fact, the salesman was probably right. If he had been on his job more than two weeks, he knew who missed questions and which ones they missed. The reporter – despite his egotism – surely did not fit the pattern and, in fact, probably would have been able to figure out how to mount a tape or disk.

The same story contains numerous quotes from a former employee. He is not identified. Nor are we told why he left the school. Did he quit? Was he fired? Was he caught selling phony CDP credentials? Who knows? We merely get to read his colorful quotations.

Impartial Appraisal?

Now it may be that these schools are as bad as their critics charge. I suggest, however, that

Viewpoint

we have not done a very good job of looking at them impartially.

Let's face it. These schools are for people who, for one reason or another, can't get into anything better. They are for the ghetto kid who just got out of the Army and is looking for a way to support a family.

He's ambitious. He wants to make an honest living, but he barely speaks English. He doesn't see himself fitting in too well in the hallowed halls of ivy. Or in the hairdressers' course at his neighborhood community college.

Like the rest of us, he has heard that computers are a good thing, and he wants a seat on the gravy train. His only chance is one of the private schools. But which one?

If he meets our standards for enlightenment, he will look for advice. He may even get a copy of the booklet, "Facts on Computer Careers," published by the Council of Better Business Bureaus and the American Federation of Information Processing Societies.

This booklet contains, among other things, three pages of good advice for prospective students at private EDP schools. (Interestingly, there is not a word to help those who are trying to figure out whether NYU offers a better curriculum than Columbia.)

For example, the booklet tells our ghetto kids to "check the qualifications of the school's instructors. What are their educational backgrounds and experience?"

"Ideally," it says, "instructors should have practical business experience in the computing field as well as training in teaching." Amen. The University of Michigan faculty should meet this criteria!

"Is the institution aware of the guidelines prepared for EDP schools by the Association for Computing Machinery (ACM) and the Data Processing Management Association (DPMA)? If so, what steps, if any, has it taken to follow these guides?"

Cast the First Stone

Now I ask you, can you picture your 17-year-old son asking your friendly neighborhood dean of computer science whether his school follows the DPMA curriculum guidelines?

And your kid can probably speak English, yet! Our guy only wants to learn how to mount tapes.

"Take at least one comprehensive examination . . . Make certain that it is graded in a valid, impartial fashion."

Again, which of us knows whether our college entrance exam or whatever was graded in a valid impartial fashion?

Come off it, guys! We ought to be past the point when our primary goal was to keep the lower classes in their place.

If we want to complain about private EDP schools, do so. But let's not invent artificial standards that don't apply anywhere else.

There are people who would be good additions to our profession. Even as operators. But they are scared off by our well-intentioned (but stupid) good advice.

The private EDP schools seem to have a legitimate role to play in our profession. So does UCLA. Both turn out people who would be better off on welfare.

What else is new?

Joseph T. Rigo is ombudsman for NYC/ACM.

Input on DOS Support Service Suggests Revolution

IBM 360 users apparently like the idea of DOS support which is now being provided by the Computer Lessors Association – in fact, they want the CLA program expanded.

The plan started early this year to fill the vacuum left by IBM's withdrawal of DOS support. At the time a Taylor Report on the development of the CLA plan hailed it as an indication of a user revolution and this was followed by reader requests that the scope of the service be enlarged to include non-CLA member 360 sites.

When these requests were passed on to CLA, readers were invited to provide input for CLA discussion – and a special questionnaire was distributed. Here are the results – and some commentary – which is being provided for CLA.

"I think, as an industry," John Jorgensen writes, "recognizing the miracle of perpetual hardware life which IBM has provided in 360s, we must be ever mindful of those pioneers who purchase computer equipment . . . Next time around, we who like to feel that the 360 is immortal may well have to purchase or go to the 370s."

Jorgensen, general manager of Computerized Business Systems, Moberly, Mo., runs a 360/50 which he says is humming along very obediently under the supervision of DOS. In his verbalization of the fundamental problem behind the IBM actions he perhaps showed the user position better than any other response. He seems to have quite a way with words – for instance, consider his comments on how they came to install a 360:

The Taylor Report
By
Alan Taylor, CDP

"We executed our divorce from IBM during February 1974. Ringing loudly in my ears is the warning to our board of directors by IBM that 'DOS is dead' and that therefore the 360 has gangrene."

Jorgensen is not alone, however, in objecting to the current anti-360 campaign by IBM.

David Harp objects to IBM's claim that the 360 is dead because IBM has turned its back on DOS customers through the discontinuation of DOS education and support.

Pressing his objection to its logical conclusion, Harp says he wholeheartedly supports the efforts of CLA to fill this void, and sends best wishes for their success and continuance, even though the replacement at the New Castle County Data Center in Wilmington, Del., may well be a 370!

Even Lobbying!

The level of support for the CLA venture went even further than just good wishes, however. Chester L. Adkins, a computer programming manager in St. Paul, Minn., tells me he has actively started beating the bushes to raise support for the DOS service. He has asked all 360 lessees in the Twin Cities to lobby their lessors for continued support – and enhancement of the service.

There is a good technical advantage in doing so, he believes, because the more they evaluate the comparative performance of the 360s/370s the more they lean toward the 360 as the most economical available system. Based on this, Adkins is volunteering both time as well as opinions to push matters forward.

Of all the responses Adkins shows the most knowledge of some of the submerged problems involved in the operation – and even has some recommendations as how to solve them. For instance, he points out that the problem of maintenance vs. enhancements is not as simple as is often suggested.

Big Changes From Small Ones

Currently the standard answer to this is that the service should supply at most only "minor enhancements." This is to protect independent software suppliers, such as Software Design, Computer Software Co., etc. However, as Adkins points out, while this is reasonable on the surface, such a decision simply does not face up to technical reality. As he points out, it is very difficult to separate enhancement and maintenance matters – and some small coding changes, such as the insertion of an Isam core index, can make a major production change.

Having faced the technical reality, Adkins has a two-step solution:

- Separate the CLA decision to continue and open up the service – which Adkins feels must be done – from the enhancement vs. maintenance issue.
- Accept the fact that "discretion" must be exercised in the development of enhancements – and that arguments will therefore be inevitable.

$25/Call Payment Approved

Dealing with the details of the responses (see box) all showed willingness to pay for call services, with most putting the figure at $25 – although higher charges had supporters also.

Gordon Moulton, DP director at South Alabama University, and Bob Hendrickson of Hendrickson, Williams and Associates in Santa Ana, Calif., were among those calling for a $60/call fee.

Prepayment plans, however, got the lowest ranking – 2%. It seems that most DOS users find that DOS is strong enough not to need the insurance-type support policy, even though it does need occasional on-call support.

Not a single objection to the extension of the service to non-CLA members was received – making this the first time that a Taylor Report questionnaire has returned a 100% one-way response. That in itself seems to be a significant justification of the extension of the CLA service.

But, really, the news for me went beyond the input for CLA. True, it confirmed my opinion that the 1974 emergence of CLA into the user environment will be revolutionary in its impacts – but it also suggested another 1974 user-environment revolution. It appears that 1974 marks the year when the user is at last facing up to the truth of the IBM 1965 rationale for raising prices on 360 equipment – that, in truth, computers can be practically immortal. And even though the software may make them temporarily gangrenous, some good programming and tender loving care can quickly cure them.

And that's the first 1974 May user-revolution

© Copyright 1974 Alan Taylor. Reproduction for commercial purposes requires written permission. Limited numbers of copies for non-commercial purposes may be made provided they carry this copyright notice. The views expressed in this column do not necessarily reflect those of *Computerworld*.

Questionnaire Results

1. CLA should respond positively to outside requests (100%).
2. CLA members should protect their own interests by:
   Charging non-CLA users more (70%).
   Making CLA membership more attractive (10%).
   Don't care (20%).
3. Per-call values of DOS support services are:
   $25 (50%)
   $40 (20%)
   $10 (15%)
   $60 (10%)
4. Permanent values in percentage of rental are:
   2% (80%)
   4% (20%)

The figures show the results of the first analysis of answers received. They are being forwarded to the CLA to help with making the decision regarding outside interests.

BOSTON PHILADELPHIA/WASHINGTON NEW YORK
LOS ANGELES
ST. LOUIS/KANSAS CITY – DETROIT/CLEVELAND

SOFTWARE MARKETING REPRESENTATIVES

NCI Is Seeking:

- Successful Systems Software Salesmen Who Are Looking For A More Rewarding Opportunity.
- COBOL Oriented Systems Engineers Who Possess The Desire To Sell And Reap The Rewards Of Success.

NCI is expanding and now markets and supports not only WORK TEN and RSVP, but also SERIES J, AXIOM, SPLIS II, PROLIB, CROSS-REF and TEXT EDITOR. Presently, over 250 installations worldwide and growing!

NCI

Send Resume To:
NCI, Inc.
6075 Roswell Road
Atlanta, Georgia 30328
ATTN: Mr. Bruce A. Forsberg
(404) 252-9474

FOR SALE OR LEASE: 1 OF 2
360/65 2860-003 2870-001
Also (1) 360/50 3 Channel

SYSTEMS EQUIPMENT LESSORS, INC.
666 Steamboat Road, Greenwich, Conn. 06897
Short and Long Term . . . . . Tax Shelter Specialists
Connecticut (203) 661-2700 – Ogden Bigelow
Illinois (312) 678-5144 Al Sartini

WANTED: 370/3155 Model I or J
AVAILABLE: 12/74 – 2/75 158's/168's

'LEASING SPECIALISTS'

DP Function Doesn't Exist in Vacuum – Part II

Plans Must Be Developed Concurrently

By Louis Fried
Special to Computerworld

In order to be relevant, the hardware, software and staffing plans must be developed concurrently. Within some limits a regular perusal of currently published materials provides adequate indicators to the general trends of changes to be expected in the hardware and software fields for up to five years into the future.

Another indicator is simple business economics. We can expect that any computer manufacturer will want to obtain sufficient return on his investment in a new product line before making it comparatively obsolete with a new model. For example, we know that the IBM 360 had a product life of about eight years. We can assume some changes in technology but we can reasonably expect the 370 to have a product life of at least five years.

Given various software options and a staffing level consistent with the level of expense authorized by top management, a schedule should be developed for implementing the applications in their order of priority. In addition to indicating manpower and software requirements, this schedule should indicate the computer time necessary for development and operation of the proposed systems and any additional hardware that may be necessary to contain the data base or accommodate the additional time requirements. This schedule becomes the basis for the hardware plan.

Parallel Planning

The software plan, developed concurrently with the hardware and staffing plan, will influence and be influenced by both of these.

The characteristics of the operating system will influence the hardware selection and influence the training and caliber of the staff required for the installation. Some operating systems may require the purchase of significant numbers of auxiliary software packages. In addition, an efficient operating system may lower the requirement for hardware.

Viewpoint

The operating system must be selected with a view toward the ultimate needs of the systems plan. In order to meet the objectives of the systems plan, a conversion of operating systems may be required. Such a conversion will have a major impact on staffing and must be considered in the schedule of system implementation and hardware delivery.

The systems plan must also be evaluated for the potential use of packaged software.

Documentation and technical standards must be reviewed and plans developed for their maintenance and enhancement. A change of operating systems, for example, will require major changes in the standards of the installation.

The software plan contributes additional cost to the total budget in terms of the anticipated price of software, the anticipated cost of conversions and estimated amounts for upgrading and maintaining documentation and technical standards.

A staffing plan should be relatively specific for 18 months into the future and generalized beyond that for at least another 12 months.

In allocating time for personnel one would normally expect to budget for maintenance projects, enhancement projects, feasibility studies and new system projects. This time, which may be considered "chargeable" or productive time, should not be budgeted beyond 70% of the available time of the personnel dedicated to this work. This will allow for the use of personnel time in training, vacations, sick leave, organization meetings, etc.

In addition to the above, time should be allocated for such efforts as do not directly result in productive work for the user. For example, budgets should be established for the maintenance of systems software, instruction and training, anticipated loss due to turnover, conversion efforts and research and planning.

The Control Plan

The control plan consists of the policies, procedures and techniques necessary to provide DP management and general management with the tools necessary to control the direction and monitor the performance of the DP organization.

An essential ingredient for the monitoring of performance is a system permitting the charge-out of project development and operation cost to the users. This system should preferably be structured to include overhead factors that result in the recovery of all costs of the DP organization. Guidelines must be established for the control of project cost and time on a regular basis.

Louis Fried is vice-president for management services at Pioneer National Title Insurance.

NCC:
Have a great show
in the Midwest!

(Why not join us in the California super-market in september?)

WESCON74

Sept. 10-13, 1974 · Los Angeles Convention Center

Call us anytime: (213) 381-2871
3600 Wilshire Blvd, Los Angeles, Ca 90010

OMNITEC
INTRODUCES THE MODEL 501A

Now available is an inexpensive coupler for teletype use from one of the oldest and most respected names in acoustic couplers – OMNITEC.

Even with the low price, this unit features – half or full duplex switching, carrier indicator light, minimum installation time, off-the-shelf delivery in most quantities, but most of all – the OMNITEC high standard of quality.

Sound too good to be true? Call us and see –

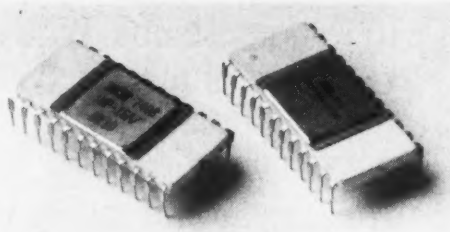
OMNITEC CORPORATION
2405 S. 20th Street
Phoenix, Arizona 85034
(602) 258-8246

THE MICROPROCESSORS

THE CHIPS

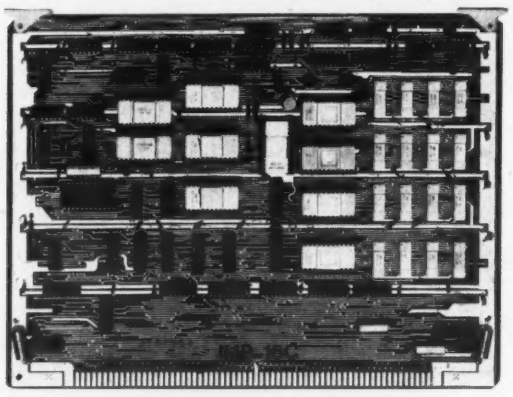
Microprocessors for do-it-yourselfers.
On distributors' shelves now.

Two building blocks that can be assembled to form computer systems from 4-bits to 32-bits.



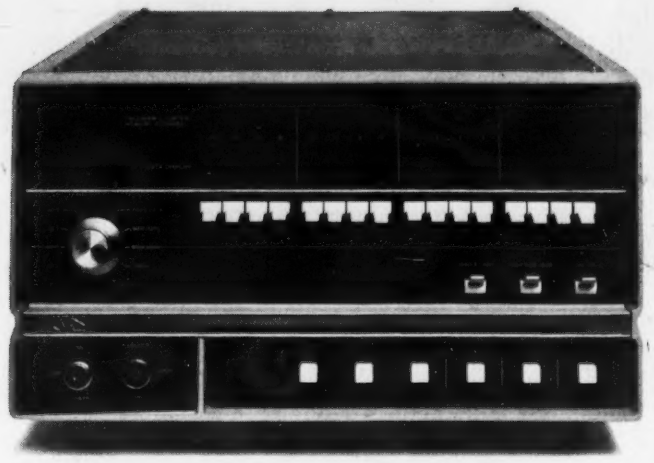
Chip #1, the one that does the work, is a Register and Arithmetic Logic Unit (RALU). And chip #2, the one that tells the RALUs what to do, is a Control and Read-Only Memory (CROM).

THE CARDS



For people who want to save time, we offer our "ready-mades."

Complete, proven, fully-debugged 8 and 16-bit microprocessors on 8½ by 11 inch cards ready for your application program.



THE BOXES

The advantage of the whole microprocessor thing lies in the fact that it is standard hardware designed and built for you to *program* to your specific application.

Our boxes help you do that.

They're program debugging and prototyping systems, providing everything the engineer needs to develop and test both the interfaces and application programs.

Each box includes microprocessor card, programmers control panel and peripheral interface, memory, power supply and chassis.

National supplies it all.

Chips, cards, systems.

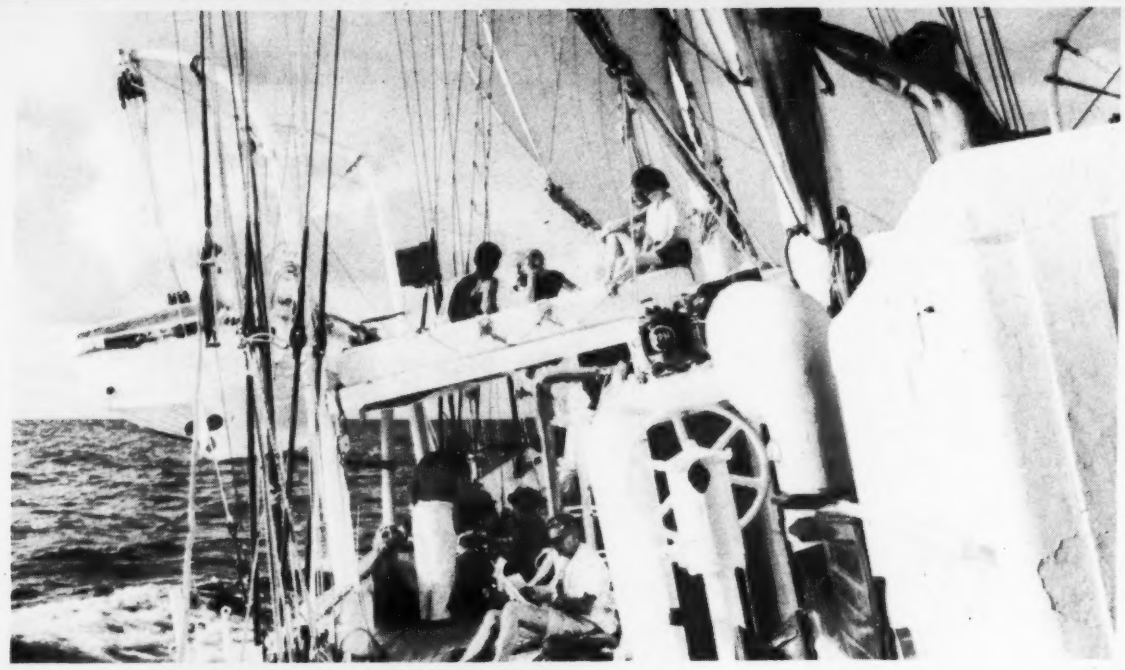
And we support our hardware with a wide array of software, firmware, and accessories that help make the whole thing easier to apply.

For further information write National Semiconductor Corporation, 2900 Semiconductor Drive, Santa Clara, California 95051. Attn.: Microprocessor Marketing.

NATIONAL

See us at Booth 753 at the National Computer Conference.

Take off your shoes.



Hit the deck in shorts and a tee shirt. Or your bikini if you want.

You're on a leisurely cruise to remote islands. With names like Martinique, Grenada, Guadeloupe. Those are the ones you've heard of.

A big, beautiful sailing vessel glides from one breathtaking Caribbean jewel to another. And you're aboard, having the time of your life with an intimate group of lively, fun-loving people. Singles and couples, too. There's good food, "grog," and a few pleasant comforts…but there's little resemblance to a stay at a fancy hotel, and you'll be happy about that.

Spend ten days exploring paradise and getting to know congenial people. There's no other vacation like it.

Your share from $245. A new cruise is forming now.
Write Cap'n Mike for your free adventure booklet in full color.

Dept. 404

Windjammer Cruises.
A WINDJAMMER INTERNATIONAL SUBSIDIARY • OTC

Name _____

Address _____

City _____ State _____ Zip _____

Phone _____

P.O. Box 120, Dept. Miami Beach, Florida 33139

He Got to the Top but DP Wasn't Fun Anymore

By Miles Benson
Special to Computerworld

The manager stood at the window of his office and watched the river flowing by several stories below. It was polluted, of course – the waste materials from his company, American Steel and Foundry, had seen to that.

Paul S. had earned the right to stand at his window and look out. He had joined the company as a programmer, full of fire and energy, convinced that computing was the wave of the future and that he was surfing in on its crest. Coding was exciting, then . . . and so was flowcharting . . . and so was checkout . . . and so was . . .

The Sociology of Computing

Where Did It Go?

Something had gone wrong, somewhere along the way. The excitement had died, the fire had gone out, the energy had been channeled into other things.

That was it – channeled. Somewhere along the line, Paul S. and his computing free spirit had been channeled, like the river below, into areas where he hadn't really wanted to go.

Why was he standing in this office, looking out this window? It wasn't ever what he'd wanted. Making budgets, and ranking employees, and assigning tasks that he would rather do himself had never been what he'd wanted. He'd give his eye teeth to be on the team trying out structured programming concepts on the new data base management system, instead of being here, four floors and three levels of management above it all.

And polluted. Again, like the river below. Getting to this office and this window had been a series of compromises for Paul S., each one knocking a little chip off his integrity, until the person he was now was not one he really liked very well. Get the job done. Never mind the consequences.

He thought back over those little chips of integrity.

He had shed his first chip not too long after he had joined American, in the computing methods organization. He and a coworker had shared responsibility for maintaining the linkage editor function of the operating system. They seemed to be competing for a lead spot. Paul had kept the pressure on his coworker, pointing out his flaws, redoing his work, telling management how ineffective it was. Subtly. There was just enough truth in it, just barely enough, to make it stick. Paul got the job.

The second chip came off when, as a methods lead, he had participated on a minicomputer selection team. There had been a clearcut winner, a computer that turned handsprings over its competitors for American's application. But management had a preconceived notion as to who should be the winner. And Paul, seeing the handwriting on the wall, had made the very practical decision to switch his vote and support management.

He was up another level of supervision when the third chip came off. Paul had a job opening to fill. A good friend of his, a computing specialist with qualifications that wouldn't quit, needed the job. He was on the quiet side, this friend, and the other logical candidate for the job was aggressive. Not as well qualified, but aggressive.

An aggressive person on the staff might give Paul a short-term boost which could push him another rung up the corporate ladder, before the technical lack became apparent. Paul did not hire his friend. And he did move up another notch.

There had been little chips along the way, too. American had a bad case of a communicable corporate disease. Parochialism consumes a great deal of energy from its victims. If the technology organizations won't help you with the hardware scheduling problem, write a memo saying so.

If an accounts receivable user admits an error in input data, document it. If controls let some reports slip through erroneously that either they or you should have caught, be sure *their* error is on record. If you make a decision – and avoid making one as long as you can – get everyone in the company to sign in agreement. Document. Record. Protect. Paul S. caught the disease, and made it into a game, and played the game very well.

And here he was. A success. The Great American Dream come true. Paul S. had parlayed his computing background into a good corporate position.

Channeled and polluted. Computing wasn't really very much fun any more.

Letters to the Editor

Scoring Mental Heath

I would like to offer a few comments and observations with regard to the April 10 article by Edie Holmes on psychological test evaluation.

In the late 1950s the Mayo Clinic established the first automated scoring and computerized interpretation system for the MMPI. This precipitated much research and development with regard to the MMPI. In the late 1960s the Roche Psychiatric Service Institute was established specifically to score and interpret the MMPI. Its endeavors have been so successful that as of 1973 we have accumulated in excess of a half-million MMPI cases on our computerized files.

All patient records are completely anonymous to the Roche Psychiatric Service Institute. The institute is dedicated to research and development of its computerized interpretation system.

To my knowledge there are approximately a half-dozen or more such services being offered throughout the country. Within the psychiatric field they have received much acclaim.

If any readers are interested in comparative studies among all of the automated services, they should refer to the *MMPI Handbook* by Dahlstrom, Welsh and Dahlstrom.

Dolores J. Stammer
Program Manager
Roche Psychiatric Service Institute
Nutley, N.J.

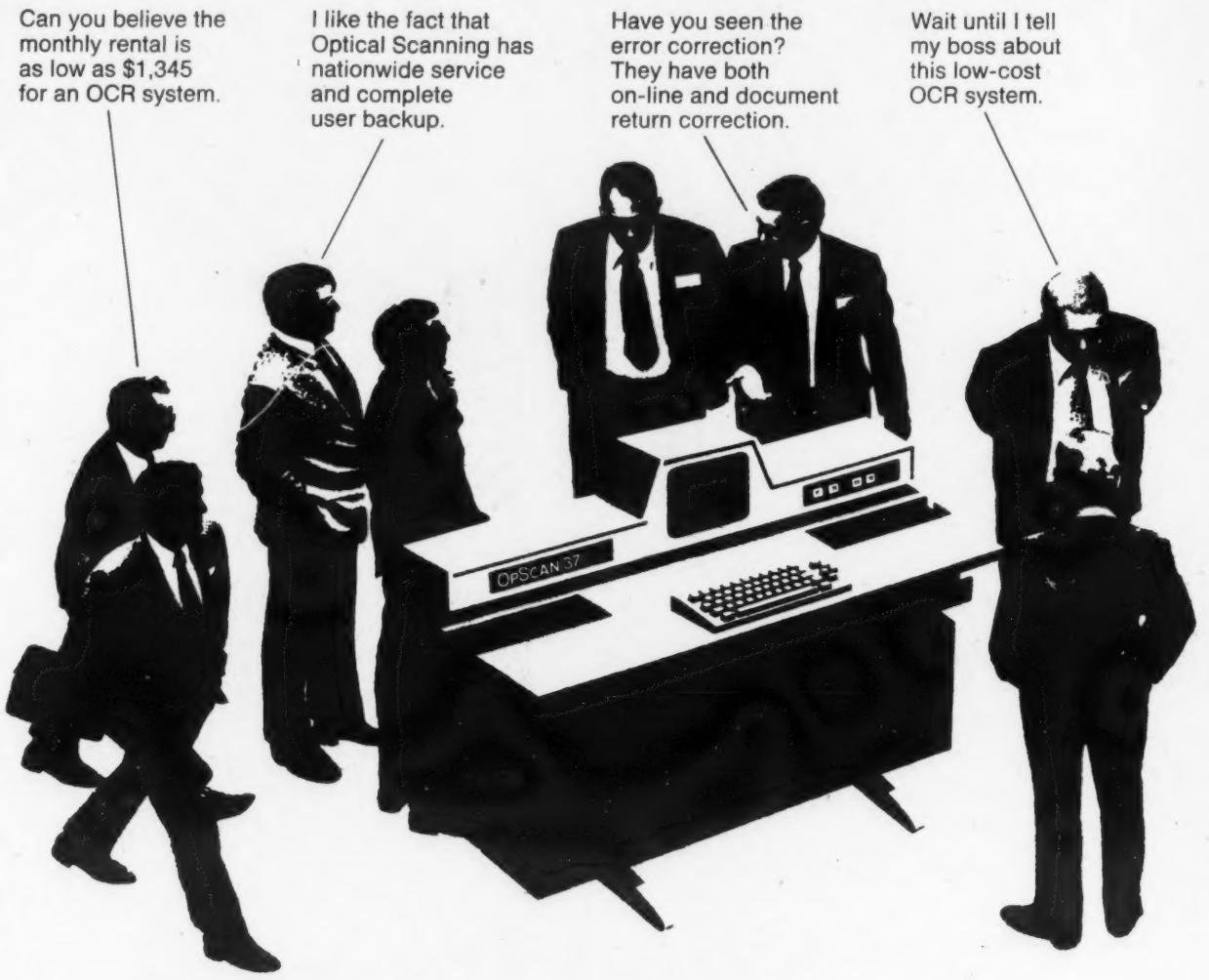
Muddled Thoughts?

I found Herb Grosch's letter to James H. Binger of Honeywell [CW, April 24] a truly asinine piece of rubbish. Carrying these muddled thoughts to conclusion, we should have zero defense and no means to keep our country and other friendly countries free from violent takeover. Really, Mr. Grosch, you should resign your job and move to a "flower people" commune where you can think nice thoughts about other people's navels.

Hal Womersley

Jacksonville, Fla.

Everyone is talking about the OpScan 37 OCR system!!!



Contact us today.
We'll give you more good reasons why everyone is talking about the OpScan 37.

Optical Scanning Corporation
Newtown, Pennsylvania 18940
(215) 968-4611
Nationwide Sales and Service

ONE WAY OF COPING WITH YOUR IBM 1130:

THE OTHER:

Face it. The 1130 has been discontinued.

That may not bug you now, but sooner or later you're going to be up a creek.

And the only solution IBM can offer is moving you up to a bigger, more expensive computer with all new software to write.

General Automation has a solution that's simpler.

The DMS.

Even if you think you're happy with your 1130 now, we can replace it with our basic DMS at a monthly cost savings of about 40%.

As your needs grow, our system can grow with you. In fact, we can give you up to ten times the throughput of an 1130. Just add what you need when you need it.

You can even add real-time capability. With a choice of two new operating systems: DPS or CMS.

But you'll never pay more for our DMS than you're paying right now for the 1130. And you can run more than 95% of your existing software without change.

Our specialists are constantly developing more peripherals and software for you. Our user group is constantly trading information on how to get the most from the system.

Now you can see why our DMS has replaced more than three hundred 1130's. Four times more than anyone.

We believe a system that can do all this for you is a much prettier sight than what you're looking at now.

☐ I want to know more about the DMS and why it's the number one replacement for the IBM 1130.

☐ Forget it. I still want to keep my head in the sand.

Name_____

Company_____

Address_____

City_____

State_____ Zip_____

Mail to General Automation, 1055 South East Street, Anaheim, California 92805. Or call us at (714) 778-4800.

DMS SYSTEMS BY GENERAL AUTOMATION

LOW-PRICED
acoustic coupler
MODEL 150 NO FRILLS
• For use with all Series 33 TELETYPE Terminals.
• Half/full duplex switch.
• Carrier indicator.
$147

ComData member of IDCMA
7544 West Oakton Street
Niles, Illinois 60648
Phone: 312/692-6107

Dutch Aim for Computer Appreciation...

UTRECHT, The Netherlands – "The formative value of learning how to work with a computer cannot be underestimated. It cultivates a strong operational, algorithmical and organizational attitude toward problem solving," according to G. Vonk.

Vonk, who is with the Institute for Development of Mathematics Education here, was discussing the aims of a computer appreciation course which is being implemented in secondary Dutch schools.

Education Around the World

"Pupils often manage to dodge an issue with a show of verbosity, which in actual fact is a cover for a lack of insight into the issue," he said.

"With computers this tactic would not get them very far. They would be required to know precisely what they were talking about as well as the order in which to present the case.

"In short, they would have to make their knowledge operational," Vonk stated.

Vonk expressed the opinion that such topics as binary systems, flip flops, magnetic core memory, and other hardware and software should not share the level of importance attached to applications in a computer appreciation course.

"One should always take care to avoid overemphasizing programming, or even worse, to allow the subject to degenerate into a programming course," Vonk stated.

"A great deal of attention should be given to common computer applications which are interesting and which demonstrate the importance of using a computer," he said. "In dealing with these broader applications, the all-important notion of a computer model as being a close approximation to a real situation should be made apparent."

...While French Seek Awareness

PARIS – A program for the introduction of informatics into secondary education in French schools has been launched as a result of the 1970 Sevres seminar, organized by the Organization for Economic Cooperation and Development (OECD).

This program consists, for the most part, of clubs open to students on a voluntary basis.

The objective of this approach is to produce an awareness of the methods of information science not by introducing informatics as a new educational discipline, but rather by applying it across the disciplines already taught.

To date, the National Ministry of Education has installed minicomputers in four high schools, operating in a time-sharing mode.

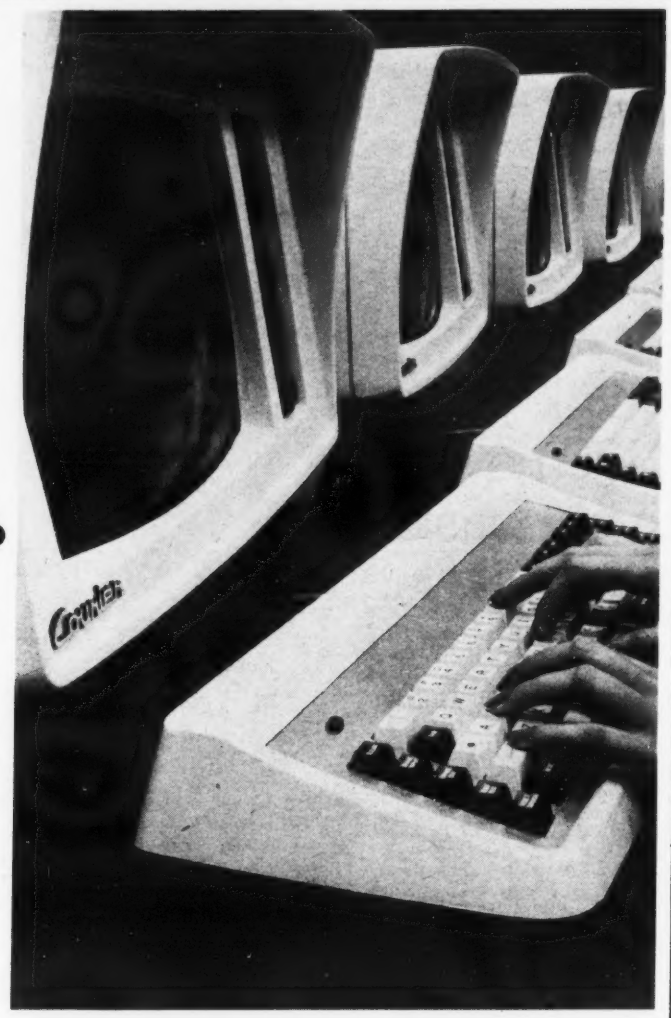
A specially designed programming language – LSE (Language Symbolique d'Enseignment) has been made available, according to W. Mercouroff of the ministry. It has the advantage of simple syntax with the key words in French, he said.

The continuing plan of action, controlled by the National Pedagogical Committee, calls for the methodology of informatics to be assimilated into the teaching of a number of disciplines, including literature and languages, natural science, mathematics, industrial technology and physical science and the humanities.

'Now Here's Another of Those Courses I Don't Consider Contributing to Our Scholarly Image'

3270 plus.

Courier designs for Reliability



Our controllers are designed to keep your terminal operators busy. Both remote and local controllers are available with Courier's exclusive redundant configurations. Any component failure in a controller results in only a momentary interruption of terminal usage. The simple touch of a switch puts the entire subsystem back on-line.

Additionally, should a controller fail, ours can be repaired without ever taking the subsystem off-line. Internal diagnostics, which run parallel with on-line activities, facilitate trouble-shooting without disruption to the teleprocessing system.

Coupled with the best price/performance and configuration flexibility available today, the Courier 270 family of 3270 compatibles is tailored to meet your needs.

For complete details write us in Phoenix, or call one of our sales offices:
Atlanta (404)294-6166; Boston (617) 890-0020; Chicago (312) 696-4360; Cincinnati (513) 984-1555; Dallas (214) 233-9002; Denver (303) 399-6990; Houston (713) 225-9561; Los Angeles (213) 641-6495; Minneapolis (612) 835-6999; New York, N.Y. (212) 758-4955; Philadelphia (609) 795-3348; Phoenix (602) 244-1392; San Francisco (415) 989-6580; Washington, D.C. (202) 223-9400.

Our people think about your people a lot.

Courier Terminal Systems, Inc.
2202 East University Dr., Phoenix, AZ 85034 (602) 244-1392

WHO'S WHO
in EDP management for the largest US corporations? Consult the
1974 DIRECTORY OF TOP COMPUTER EXECUTIVES
Over 2500 senior EDP user managers in:
• Manufacturing & Service
• Banking
• Finance
• Insurance
• Retailing
• Transportation
• Utilities
Includes complete company name & address, phone, titles and major systems.
Published semi-annually in February and August.
Applied Computer Research
P. O. Box 9280
Phoenix, AZ 85068
(602-944-1589)

Thicker Cubic straightens out edge damage.

Memorex Cubic computer tape is thicker than other computer tapes – it can take anything you or your computer gives it. So you get a lot more tape life and performance for your money.

Cubic is thicker where it counts most, in the base film. It isn't shorter or longer or wider or narrower than other tapes, but thicker. Thicker because a tape's resistance to edge damage increases with the cube of the base film thickness. Cubic straightens out edge damage problems which are the primary cause of premature tape retirement.

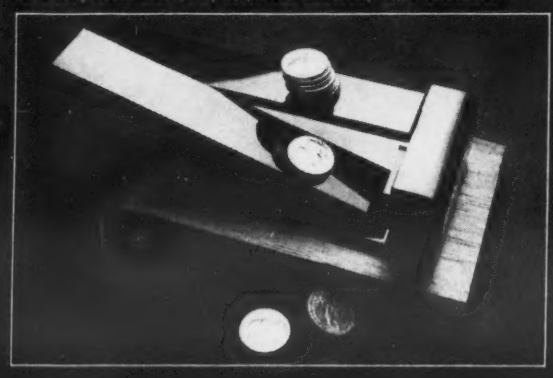
Cubic's 25% thicker base film doubles its resistance to edge damage. And it improves life and performance in seven other ways.

• Cubic reduces read errors on outer channels and track-to-track displacement errors • Reduces edge debris and debris-caused errors • Minimizes tape wrinkling, creasing and cinching • Starts and stops faster, more consistently • Spans autoload gaps and loads into drives more reliably • Runs through guides more positively • Rides flatter on heads.

These are all Cubic bonuses. And you still get a tape fully certified to 6250 BPI.

You can prove Cubic is a thicker/stronger tape for your dollar by laying money on it with the tape tester which every Memorex representative carries.

Memorex Corporation, 1125 Memorex Drive, MS 00-64, Santa Clara, CA 95052

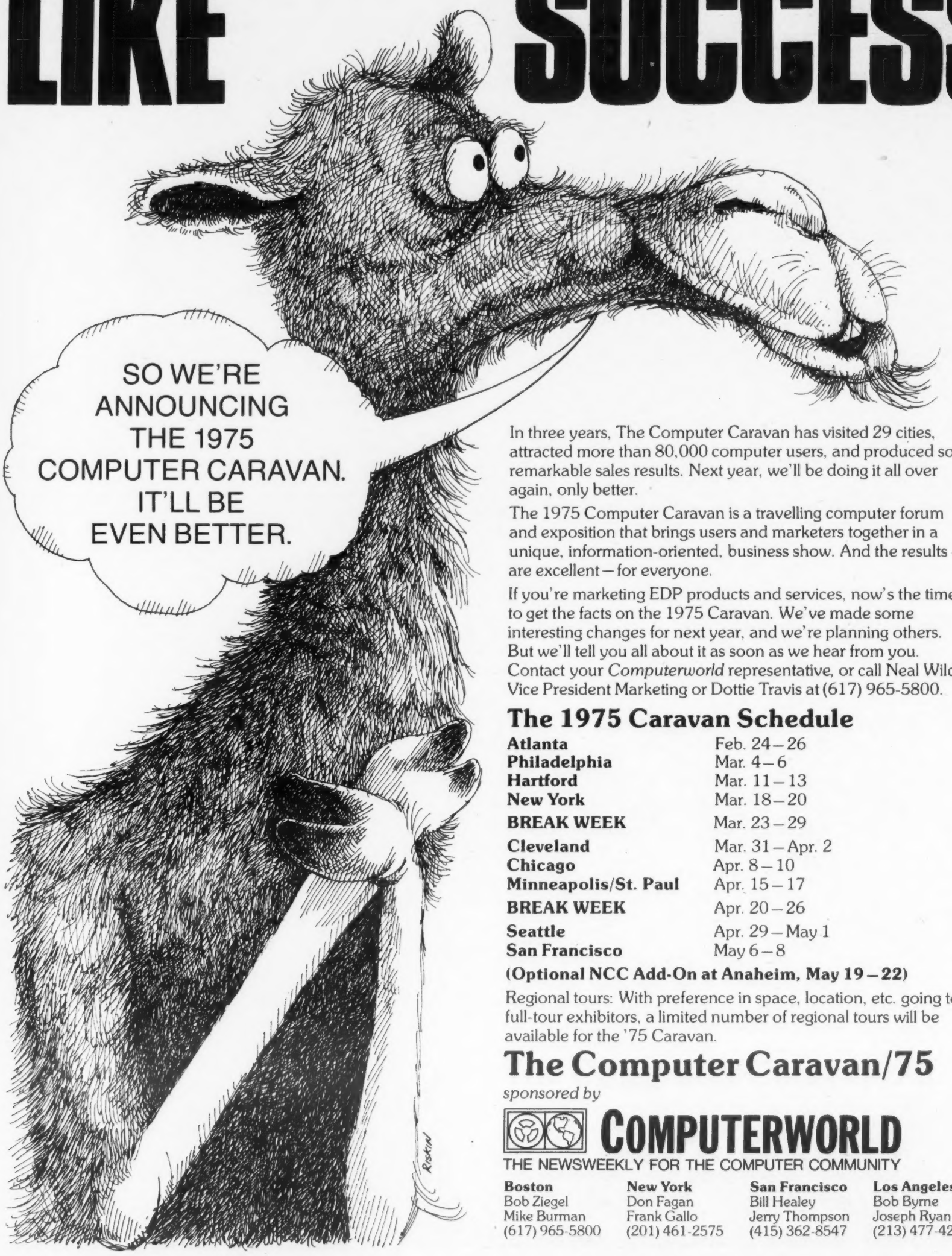


MEMOREX

Cubic: A tape you can lay money on.

Try the Cubic tape test at Booth 1214-1216, National Computer Conference in Chicago, May 6-10.

NOTHING SUCCEEDS LIKE SUCCESS!



In three years, The Computer Caravan has visited 29 cities, attracted more than 80,000 computer users, and produced some remarkable sales results. Next year, we'll be doing it all over again, only better.

The 1975 Computer Caravan is a travelling computer forum and exposition that brings users and marketers together in a unique, information-oriented, business show. And the results are excellent – for everyone.

If you're marketing EDP products and services, now's the time to get the facts on the 1975 Caravan. We've made some interesting changes for next year, and we're planning others. But we'll tell you all about it as soon as we hear from you. Contact your *Computerworld* representative, or call Neal Wilder, Vice President Marketing or Dottie Travis at (617) 965-5800.

The 1975 Caravan Schedule

Atlanta	Feb. 24 – 26
Philadelphia	Mar. 4 – 6
Hartford	Mar. 11 – 13
New York	Mar. 18 – 20
BREAK WEEK	Mar. 23 – 29
Cleveland	Mar. 31 – Apr. 2
Chicago	Apr. 8 – 10
Minneapolis/St. Paul	Apr. 15 – 17
BREAK WEEK	Apr. 20 – 26
Seattle	Apr. 29 – May 1
San Francisco	May 6 – 8

(Optional NCC Add-On at Anaheim, May 19 – 22)

Regional tours: With preference in space, location, etc. going to full-tour exhibitors, a limited number of regional tours will be available for the '75 Caravan.

The Computer Caravan/75

sponsored by

COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

Boston	**New York**	**San Francisco**	**Los Angeles**
Bob Ziegel	Don Fagan	Bill Healey	Bob Byrne
Mike Burman	Frank Gallo	Jerry Thompson	Joseph Ryan
(617) 965-5800	(201) 461-2575	(415) 362-8547	(213) 477-4208

Datalaere — Danish May Change Name But Subject Is DP

COPENHAGEN – Denmark is adding a new discipline to its existing school subjects – datalaere.

Basically, the discipline is computer science, but the new name was chosen because of an unwillingness to connect the new subject with special data processing routines and with special sorts of equipment, according to Stig Obel, assistant director of education, Direktoratet for Gymnasieskolerne og Hojere Forberedelseseksamen.

"The school discipline consists of different subdisciplines such as the data concept methods of problem solving, algorithms and algorithmisation, and communication of algorithms (including some programming)," Obel said. "Datalaere as an educational subject focuses on communication and problem solving."

Danish educators see no reason why

Education Around the World

datalaere should not be part of the curriculum in compulsory school – grades one through nine – and plan to integrate it in mathematics courses. The formalism in the theory of sets, groups and logic is naturally extended into the datalaere area, Obel said.

Teaches Decision-Making

Datalaere, Obel feels, supports the main aims of compulsory schooling since it gives the majority of students an opportunity to show creativity and imagination and allows them to make individual decisions.

In addition, the solution of problems in datalaere will often demand cooperation within a group, preparing the students to enter society.

The students should, through datalaere, be able to recognize different forms of data carriers, data representation and data structures from everyday life, Obel said. They should also be able to program and run small examples on a computer in a simple language, describe the main phases in data processing, the main components in a computer and the main uses of data processing.

Another main aim of compulsory school is to make students ready to take their places in society, Obel said. "The use of the computer is playing an increasing role, and it is therefore desirable that all pupils leaving the school system should have some knowledge of this aspect of our society," he concluded.

the best
of two data communication worlds

BEEHIVE terminals

SEE YOU AT THE "NCC" SHOW

Asynchronous Data Transfer Rates Up to 9600 Bps.
All TTY Compatible Codes
Detachable Keyboard
Half or Full Duplex On-Line Operation
teleprinter-compatible
MINI BEE

Protected Field Formatting
Baud Rate Transmission To 9600 Bps.
Complete Edit Capability
80 Character X 25 Line
Detachable 96 Key ANSII Keyboard
Conversational or Block Mode
Complete Cursor Control
Eight Special Function Keys
micro-programmable, ROM
SUPER BEE

call, write or wire for a demonstration before you buy

Beehive Terminals • 870 West 2600 South • Box 19244 • Salt Lake City, Utah 84120 • (801) 487-0741 • TWX 910-925-5271

EAST: Maryland, (301) 588-8134; Massachusetts, (617) 623-7800; New York, (516) 487-0690, (315) 437-6666, (716) 328-2230, (607) 785-9947; Pennsylvania, (215) 265-1020; Florida, (305) 425-5505, (305) 776-4800; Georgia, (404) 939-1674

CENTRAL: Alabama, (205) 539-4411; Illinois, (312) 298-3600; Indiana, (317) 244-2456; Kansas. (913) 362-2366; Louisiana, (504) 366-5766; Minnesota, (612) 884-4336; Missouri, (314) 938-4992; North Carolina, (919) 768-3600, (919) 489-1546; Pennsylvania, (412) 366-5056

WEST: Arizona, (602) 956-5300; California, (415) 321-2414, (213) 937-0790, (714) 544-5121; Colorado, (303) 355-3521; Oregon, (503) 646-3004; New Mexico, (505) 265-5655; Texas, (214) 231-4846, (713) 661-4501, (512) 732-7176; Washington, (206) 624-9020

CANADA: Toronto, (416) 742-8015; Ottawa, (613) 729-4004; Montreal, P.Q. (514) 488-0404; British Columbia, (604) 526-3312

EUROPE: England, 01-952-8471; Holland, (020) 151602; Netherlands, (020) 151602; Sweden, 08/820410; Denmark 01/804200; Norway, 02/282624; Finland, 460844; France, 16/861547; Switzerland, 22/332329

TDG-L • • • • Test Data Generating Language

THE IDEAL SOLUTION TO A PROBLEM
THAT HAS LONG PLAGUED EDP DEVELOPMENT

TDG-L provides an easy and economical method for insuring with a high degree of reliability, that your newly developed and enhanced programs will perform as intended.

BENEFITS

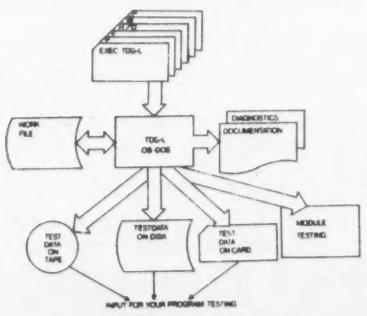
- Easy to Learn and Use
  2 Hours to train your staff
- Save Time and Money
  Reduces Test Preparation Time up to 90%
- Minimize the risk of Production Breakdown
- Reduces Time Cycle for development
- Increases programmer morale credibility
- Language Independent operates with any language
- Eliminates test data storage
- Programmer Independent others can prepare Test data
- Automatic standarized documentation
- Test all normal and abnormal conditions
- Increases Quality and Reliability of Programs

POWERFUL FEATURES

- Free Format Coding
- Module Testing Capability
- Any forms of Storage – Packed, Zoned, Binary, etc.
- Any File access system – Index Sequential, IMS, Bomp, Direct Access, etc.
- Complete Control over desired test data
- Develops hierarchial structures and field to field relationships
- Generates fixed or variable length records
- Operates with all IBM 360/370 Operating Systems. DOS, OS, VS, VS1, TSO, etc.
- Comprehensive Diagnostics
- Output printed in Hexidecimal and/or Zoned format
- User Exit Capability

WORKFLOW

JCL and four Parameter Groups are the only Input



TRY TDG-L
NO OBLIGATION

- We will install on your computer
- We will train your staff
- We will supply all necessary documentation

Evaluate for 30 days and decide for yourself.

For Additional Information or a free test, write or call:

KEITH & ASSOCIATES
11500 STEMMONS
DALLAS, TEXAS 75229 - (214) 620-1860

Of doves, and flexible disks, and the good things in life.

Last month we invoked the assistance of eighteen white doves and a friend named "Gus" to help us call your attention to our new line of flexible disks.

The response was something else!

We received many compliments on our advertisement.

We also received many orders for our new disks. We thank you.

If you missed our message, here is what we said.

Information Terminals has the newest flexible disk on the market. To begin with, IBM offers their Diskettes which are totally compatible with our new disks. Good for them. Not better than, but 100% compatible.

Fact. We believe ours to be the best. Give us a chance to prove that statement.

No disk from any other company can outperform it.

No disk from any other company can outlast it.

Our new disk may very well be perfect. That's why we absolutely guarantee each individual disk to be 100% free of errors. There are no exceptions.

And we're delivering in fine style.

For ordering information and our list of representatives,
Call toll free: (800) 538-7938
In California: (408) 245-4400

Information Terminals Corporation
323 Soquel Way
Sunnyvale, California 94086

Scots Emphasize Batch Packages

GLASGOW – While on-line facilities are rare in Scottish schools, every secondary school pupil in Scotland has access to batch computer facilities. And that is one reason why educators here have concentrated on developing batch packages for secondary subjects.

Cost is also a factor, according to R.M. Murdoch, lecturer in computer education, Jordanhill College. But, he said, Scottish educators have also seen problems in using on-line systems facilities with even medium-sized classes.

Packages as Murdoch refers to them consist of a program or series of programs dealing with some aspect of a subject, and requiring no computer knowledge on the part of the user.

Some highly successful packages developed in the past two years have been in the area of biology, the educator said.

A good package "must in some way extend the facilities which are available to teachers, e.g., it must not merely simulate some situation which could be studied adequately in the laboratory," Murdoch said.

Education Around the World

Since many biology experiments and concepts are beyond the scope of the school laboratory, the computer package can play an important role in education, Murdoch opined.

For example, both statistical (calculative) and simulation packages have been developed in biology.

"Our [statistical] packages deal with the statistics required by the biology student and do so in a simple way," Murdoch said, contrasting them with vendor statistical packages which "do more than is required at school level."

An example of a package currently being developed is one dealing with students, considering age, height, hair color, etc. The package, he said, will enable a school to share data collected in each of the other schools using it.

It Had No Business 'Cents'

HARRISON COUNTY, Ind. – When the new administrator of the county hospital recently looked at his operating figures printed out by his bookkeeping computer, he was shocked to learn the hospital had lost over $90,000 in the few weeks he'd been on the job.

However, administrator John Vie found out after some investigation that the computer wasn't programmed for the business side of the hospital's operation. It just took care of the census figures.

As a result, when Vie used business figures, they would not compute and the machine would spew out ridiculous amounts of numbers.

The program has since been changed, Vie commented.

STANDARD DATA HAS SOMETHING FOR EVERY VM/370 INSTALLATION

SYMBUG™ Interactive COBOL Symbolic Debugging System

SYMBUG-F™ Interactive FORTRAN Symbolic Debugging System

ICS Integrated CMS Sort (OS compatible, stand alone, and invokable from COBOL, PL/I and Assembler)

VM/370 ISAM CMS Simulation of OS ISAM

D-SAVE File Compression (50% disk savings)

EXECMOD Conversion of EXEC files to Assembler code

GLAP Generalized language processor implementation for CMS

SLAP Specific language processors for CMS-featuring Assembler H, COBOL F, OS Fortran G, PL/I, RPG and LCP

Software for VM/370 'Superior by Design'

The VM/370 software offerings from Standard Data Corporation make for more efficient use of computer resources; and that means significant savings in operating expenses. Let us show you how. For more information contact. . .

STANDARD DATA CORPORATION/ 1540 Broadway, New York, N.Y. / 212/586-3100

Since 1959

Building an Entry System Under DOS/VS – Part II

28 Terminals, CICS/Dbomp Base Bring Orders On-Line

By Don Leavitt
Of the CW Staff

SPRINGFIELD, Mass. – To get its Dbomp/CICS-based order entry system running effectively on-line to all concerned user departments, Milton Bradley Co. (MB) tied a total of 28 local and remote IBM 3270 CRT terminals to a 370/145 with 393K bytes of main memory and six 3330 disk drives.

The terminals are distributed throughout the toy maker's main manufacturing facility in nearby East Longmeadow, Mass., and accounting and control sections within the company's headquarters here. Though most are keyboard and CRT only, several units have IBM 3234 matrix printers to capture hard-copy documentation to confirm decisions made.

In operation, the system starts as orders are received, batched and assigned to order entry operators. The operator evokes the preformated CRT screen appropriate to the transaction being processed, and proceeds to enter basic customer information, header codes and individual line items related to the order.

With that skeletal information, the system puts together a record containing complete customer background. Full customer identification, back-order practices, special packaging instructions, credit limits, carrier priorities, allowances, and calculated unit prices are all picked up from other system files.

All this information is available to an on-line inquiry terminal immediately after it is entered through the original keyboards. This "instant" availability is particularly valuable, MB noted, for prompt action by support functions, such as credit authorization.

Although customer service – the ability to accept, modify and respond quickly to customer needs – was the principal goal of the new order entry system, the company itself has reaped several benefits almost as by-products. The ability to spot and correct errors as data is entered on-line has, for example, meant fewer errors than under the old batch system.

The "paperless" system saves substantial amounts of paper and card stock, but it has also led to improved procedures by accounting department personnel. The system has also, in effect, forced better controls throughout the order entry process. Since credit checking is not based on paperwork, for example, items that need more evaluation cannot be put aside and inadvertantly lost.

Reduced costs for personnel and freight handling, as schedules are optimized, are other side benefits of the system. To keep customer service and the system's inner workings at efficient levels, MB and Keane Associates, a custom programming house, developed a data base made up of 13 separate files. Originally 23 files had been planned, but the access methods and complexity of such a structure would have prevented the immediate response the company saw as mandatory.

Debugging the Dbomp interface with CICS supplied by IBM, Keane organized the files into four major groups. Among the Dbomp/CICS problems encountered and resolved by Keane were slow response times, "memory lockups," and a ballooning overhead for software.

MB's desire to work with small, modular programs, heavy machine time requirements during testing and "major" learning curve problems also had to be overcome as the system took shape.

The learning curve problem is real indeed, an MB source stressed. "Anyone going into CICS for the first time should plan on the initial effort taking five to 10 times longer if the programming staff has a Cobol rather than a BAL background," he said. "It is an implementation that is exceedingly tough for a Cobol-trained staff."

Facing and solving these problems was difficult, time-consuming and costly, but the end results are making the effort well worthwhile, the company said. Once all printing of the invoices, shipping documents and other paperwork goes on-line, the half-hour processing cycle should become a reality as well as a design goal.

MMS Package Gives Up-to-Date Materials Data

ANDOVER, Mass. – Manufacturers with a 64K partition and three spindles of disk can have current information to provide day-to-day direction for the material planning operation with the MMS Net Change Materials Requirements Planning System just introduced by Software International.

The "net change" approach differs in technique and result from the "regenerative" approach used by some material requirements planning systems, the company said. Regenerative systems periodically recalculate an entire material plan; between recalculations, the plan may not be up-to-date.

The More It Changes . . .

The net change system makes corrections to the plan as the situation changes. Such things as engineering changes, unanticipated scrappage, inventory adjustments or master schedules changes are taken into account.

The MMS package is a batch-level net change system because it takes these adjustments for each batch of input data. It generates exception reports as soon as a condition that requires management consideration is detected.

The package supports planning periods adjustable in length from one day up. It also backs the use of firm planned orders to facilitate load leveling for shop labor planning, or machine capacity limitations and multiple location inventory tracking, so that the system is not tied to just one stockroom or warehouse.

Under the MMS software, management has a wide selection of order policies and options for both purchased and fabricated parts. The package also supports planning of requirements for custom engineered, one-of-a-kind orders, the company noted.

Periodic Reports

The system is based on eight separate but integrated files, and users can inquire against either the item master file or the order master records. In addition to the exception report marking a situation needing immediate attention, the software generates a number of reports periodically.

There are 80 modules in the system which is written in BAL and Cobol and requires 64K of main storage. It is available now for DOS shops under a single payment, four-year lease plan for $65,000. OS and IMS versions are also available and will be quoted on request, Software International said from 2 Elm Square, 01810.

B&B Job Support Expanded to DOS

SUNNYVALE, Calif. – IBM 360/370 installations can have job accounting support from a single vendor, even if they shift through the entire range of IBM operating systems, by utilizing the expanded line of packages from Boole & Babbage, Inc. (B&B).

B&B has recently added Murs DOS, originally developed by Webster Computer Corp., and SMS/CAS (DOS/VS), an enhanced version of the Virtue package also from Webster, to its own SMS/CAS for OS and OS/VS sites.

Murs reports execution of each program run in a DOS environment. As each program is terminated, machine utilization records are posted to a disk for later printout. In addition to being the source for a daily utilization log, these records are summarized into reports on operations usage, operator analyses, scheduling information reports and production and test session analyses.

Off-line, noncomputer activity and other data are also summarized by Murs. The system allows operators and programmers, for example, to enter their times devoted to particular projects. The Murs reports can be geared to either elasped times or total net times, B&B said.

SMS/CAS in a DOS/VS shop is described as a complete job accounting and project reporting system. Tracking all programs run under DOS/VS, it provides a daily log as well as a program efficiency and computer operations analysis.

Murs DOS is available for $2,970 and SMS/CAS (DOS/VS) can be acquired for $3,250. Current users who bought Murs from Webster may convert to the DOS/VS accounting system for $1,000 plus an annual maintenance fee of $480.

B&B is at 850 Stewart Drive, 94086.

Fortran Source Variations Defined

HAMPTON, Va. – Programmers converting Fortran programs from one computer system to another can gain more insight into their task with a free 20-page booklet from the Technology Utilization (TU) Office at Langley Research Center here.

The book outlines source program differences between the IBM 360, Univac 1108, CDC 6000 and Honeywell Fortran compilers. A handy minimal language concept included in the publication provides a subset of instructions compatible with all four computer systems under consideration.

Even though Fortran standards have been established, the TU officer at Langley noted, source programs for the target computers may differ in at least three ways. Some implementations, he said, go beyond the standard, and programs using nonstandard extensions would have to be recoded to be used.

Conversely, there are some features of the Fortran standard that are not present in all implementations. Even if a piece of coding is technically within the standard and is acceptable on one computer system, it too may have to be revised to run in a different environment.

Programming guidelines which were used in developing a Fortran IV CDC 6400/6500 program that was subsequently converted to Fortran V for the Univac 1108 are also presented in the book, the TU officer noted.

The booklet is cataloged as LAR-11177 and was developed under contract to Langley by W.R. Garner of Martin Marietta Corp. It can be obtained from the Langley TU Officer, Mail Stop 139-A, 23665.

Work Smarter, Not Harder. Get the MMS General Ledger.

Doing the best job doesn't mean always doing the hardest work.

One of the smartest moves you can make is to install the MMS General Ledger. It's more than a software package. It's a complete corporate financial reporting system, which offers unusual flexibility because of unique data base design. And it can be used under DOS, O/S, IMS or even TOTAL. Best of all, MMS General Ledger is reliable, accurate and hard at work for more than 100 major corporations in the U.S. and overseas.

Put the MMS General Ledger—World's No. 1 seller—to work for your company. It's easier than doing it yourself . . . and very smart.

Please send me more information on your hard-working corporate financial reporting systems.

☐ General Ledger ☐ Accounts Payable ☐ Accounts Receivable ☐ Payroll

name _____ title _____ system _____

company _____ street _____

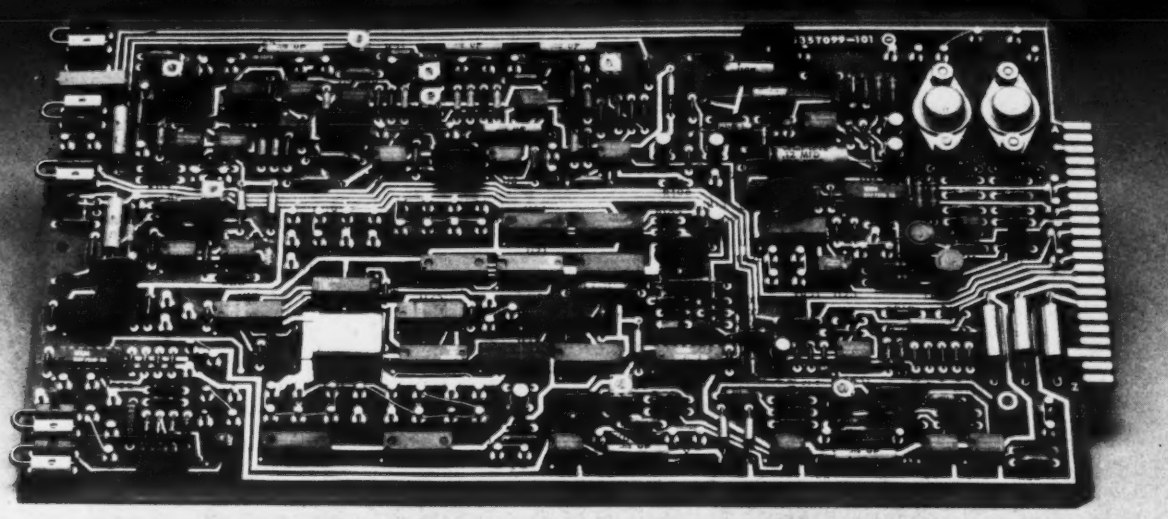
city _____ state _____ zip _____ phone _____

SOFTWARE INTERNATIONAL

Elm Square, Andover, Mass. 01810 (617) 475-5040

New York (212) 972-9540 Chicago (312) 729-7410 Atlanta (404) 255-0039
San Francisco (408) 371-0331 Los Angeles (213) 437-3301

THE NEW YARDSTICK.



Measure other VFCT's against TELE-SIGNAL'S Model 6024. Feature for feature, you'll find this new Voice Frequency Carrier Terminal outstanding.

- ☐ Single card keyer/converter.
- ☐ 24 full duplex channels in 14 inches of vertical rack space (8-rack units).
- ☐ Extensive use of digital circuit design.
- ☐ State-of-the-art active filters.
- ☐ Unique phase lock-loop in converter.
- ☐ Mark/space frequencies synthesized by digital modulator.
- ☐ Crystal-controlled transmit tone channel frequencies.

The Model 6024 provides a low cost, highly reliable state-of-the-art telegraph system for multiplex applications in data handling. For more information, write: The Singer Company, Kearfott Division, TELE-SIGNAL Operation, 250 Crossways Park Drive, Woodbury, N.Y. 11797. Or phone: (516) 921-9400.

SINGER
AEROSPACE & MARINE SYSTEMS

Proof of Deposit Bank Package Free to NCR Users

DAYTON, Ohio – Banks with an NCR Century 101 or larger Century system and high-speed Micr sorter/readers can match items deposited with their accompanying deposit slips while capturing all encoded data, with a Proof of Deposit software package now available without cost from NCR.

The float records created can be used as a basis for service-charging accounts that tend to have funds in float. As a by-product, the system also generates the "cash letters" to accompany transit items, since the system has the capacity to segregate "on-us" items from those to be sent along to other financial institutions. The Proof of Deposit logic is controlled by parameter tables for easy maintenance, the company noted.

CTS Expands Services To Typesetting Files

GLENDALE, Calif. – Camera-ready pages for manuals or texts can be created from IBM 360/370 or System/3 files through the expanded facilities of Computer Typesetting Services, Inc. (CTS). Customer input may be on magnetic tape, 80- or 96-column cards, paper tape or System/3 disk packs, the company said.

Editing software permits file updating for periodic revision of the documents produced. Output normally is from a Fototronic typesetting system, but proofs can be generated on a Varian Statos 31 printer/plotter while layouts are still being planned, CTS noted from 540 W. Colorado St., 91204.

MIT Summer School Offers DP Management

CAMBRIDGE, Mass. – The summer session at MIT's Sloan School of Management will include Computer Technology for Managers, a one-week introduction to hardware and software, designed to take the manager from novice to a good practical level of understanding. The course runs from June 4-8.

Information Systems for Managers is a two-week course of the concepts for successful information system design and implementation, being offered from June 10-21. Director of the Summer Session is in Room E19-356, MIT, 02139.

NO WAITING!

Trendata Model 1500 Cassette Tape Conversational Terminal replaces IBM 2741

Write or call for full information

trendata
An Applied Magnetics Company
610 Palomar, Sunnyvale, California 94086 • (408) 732-1790

Direct replacements for IBM 2741 terminals

- Enhanced performance at lower cost
- Rugged and reliable, with **heavy duty** I-O type Selectric
- Human-engineered for operator comfort and efficiency
- Fully plug-compatible with IBM
- Prompt delivery (30 days)
- Backed up by nationwide service
- Built-in dual switchable modems (optional)
- Optional copyholder, work area, utility shelves
- Acceptability proven by many major accounts
- Tape cassette feature for local data collection

Cobol Clinic

Rippling a Character May Be Sexy but...

I wonder if any other readers are as weary as I am of reading about the "best" way to initialize a block of storage in Cobol? I am not at all sure that I would program in Cobol, even if it were the last (or only) high-level language around. But in spite of my disinterest, Peter Dashwood's letter in the March 6 issue caught my attention.

Although I realize that "rippling" a character or field with an MVC instruction may look sexy, first you should run and grab a copy of Functional Characteristics for the CPU you use. On the 360/75 at the University of Illinois, the timing estimate for an MVC ripple is almost exactly twice as slow as doing the same thing but by moving in the initialization from a constant field area, where both fields are multiples of eight bytes long and starting on doubleword boundaries.

Example: blanking a print line.

MVC Ripple Way:

```
MVI LINE, C' ' initialize first byte
MVC LINE+1 (131), LINE and ripple down the line
execution time (360/75): 46.08 µsec (4-way intlv)
```

MVC Doubleword-at-a-Time Way:

```
MVC LINE(8), BLANKS move eight blanks into line
MVC LINE+8 (128), LINE move blanks through line execution time (360/75): 25.80 µsec (4-way intlv)
```

The second case requires that the print line be a multiple of eight bytes long (on the 75), and that both it and the eight blanks be doubleword aligned. In either of the two examples, the first instruction could be saved if the constant blank(s) can be located immediately in front of the line to be blanked. However, any way you cut it, the second case is very nearly twice as fast as the first.

Strange as it may sound, it is still possible to halve the execution time again. (This, however, must be reserved for those of us who program in Assembler Language, at least until an intelligent compiler is written, if ever.) This technique uses many more instructions than the above examples, but executes much faster than either one.

Bigger-but-Fastest Way:

```
STM 2,12,SAVE11 save registers 2-12
LM 2,12,BLANKS pick up 32 bytes of blanks
STM 2,12,LINE (reg. 1 points to line)
STM 2,12,LINE+44 blank out second third of line
STM 2,12,LINE+88 and the last third of line.
LM 2,12,SAVE11 and get back all 11 registers
execution time (360/75): 19.41 µsec
```

Of course, about one-third of that 19.41 µsec is to save and restore registers. If that is not fully necessary, about another six µsec are saved.

Not nearly enough programmers take advantage of the LM and STM instruction in moving data around. It is so fast because on the 360/75 the incremental time is .195 µsec per four bytes moved. On an MVC, the fastest one gets is about .160 µsec per single byte . . . three to four times slower! The improvement is particularly noticeable when setting or clearing large blocks of storage to some fixed value, since the larger the area cleared, the lower percentage of time spent saving and restoring registers.

Other comments on Dashwood:

- If you are unable to ripple a single byte with an MVC on your 360/40 (and if you really still want to) call your customer engineer, 'cause something's wrong. At the top of Page 54 – "Principles of Operation" specifically gives this as an example and claims that it does work, for all models of System 360.
- He should also point out that the ripple technique works differently left-to-right than right-to-left. One way will move an entire area left; the other way propagates a field to the right. However, as should be abundantly clear after reading the above, using the MVC instruction – particularly with large lengths – is generally a very inefficient way of moving data, and should be used with caution when it is used at all.

Moral of the story is: you can tell an efficient 360 programmer easily. He will have a green card in one hand and a Functional Characteristics/Instruction Times table close to hand, referencing it frequently!

Perhaps a secondary moral would be that on programs of this sort, a better-performing program will almost always turn out to be written in Assembler Language by a capable and conscientious Assembler Language programmer.

And remember, when buffering things, it is almost always more efficient to transfer pointers to data than to move the data itself! – Gordon E. Peterson III, Champaign, Ill.

TLMS-TAPE LIBRARY MANAGEMENT SYSTEM

In its 6th year of growth, TLMS is:

- A real-time tape inventory data capture and tape dataset control system . . .
- An on-line data base of tape dataset information for inquiry . . .
- Security protection against accidental destruction of live data . . .
- Clean interface to OS/360/370, compatible with MVT, MFT, ASP, HASP, VS1, VS 2 . . .
- Optional external labels in real-time . . .
- Tape history and quality control.

May we tell you more?

Gulf Oil Computer Sciences, Inc.
P. O. Box 2100
Houston, Texas 77001
713/228-7040

Gulf

KEYPUNCHING
$3.50 PER HOUR
CARDS OR TAPE
One Week Turnaround
(Friday to following Monday)
99.5% Accuracy Guaranteed on Verified Work
Specialists in Upper/Lower Case
Call Collect
Len Phillips (617) 491-2793
AMERICAN DATA PREPARATION CORP.
675 Massachusetts Avenue
Cambridge, Mass. 02139

GOOD NEWS FOR IBM AND UNIVAC USERS

Big things have happened at Fabri-Tek/Data Recall. And the best is yet to come.

BIGGER AND BETTER

Fabri-Tek, the leader in memory technology, has acquired Data Recall. We're now the largest independent memory manufacturer in the world. Seven plants in four countries. An expanded line of add-on memories for IBM and UNIVAC systems. 360's, all models. 370, models 155 and 165. System/3, model 10+. 1106 and 1108. Plus worldwide marketing capability through our own offices and affiliated agents.

MORE ADVANCED CAPABILITIES

Here are just a few of the features we offer. 1) Expansion of the 360/65 to 4 Mb from any amount of IBM core level . . . including relocate features in 256 Kb increments, with or without LCS. 2) An accelerated storage adapter (ASA) on the 370/155 that upgrades performance to 370/158 level. 3) Expansion of the 370/155 to 4 Mb. 4) 370/165 memory within the IBM limits. 5) Expansion of the 360/44 to 1 Mb.

FIRST WITH THE FINEST

Look at a few Fabri-Tek/Data Recall "firsts." First to add independent memory to the 360/22 and 30. First with the console or desk high cabinet for the 360/22 and 30. First with independent memory for the 1108. First to offer 360/65 memory over 1 Mb that provides floating addressing for all system memories. First and only independent to offer add-on memory to the 360/25. And on and on.

LEADERSHIP MAINTAINED

Our tradition of innovation is impressive, but we're not resting on past accomplishments. What we've done is just an indication of the technological advances you can expect from us in the future. So when you need more memory, go with the leader. Fabri-Tek/Data Recall – the logical choice.

Fabri-Tek/Data Recall memory extensions and service are available from these companies: Computer Investors Group, worldwide; Control Data Corporation, worldwide; CERO, Spain; FTI U.K., Eastern Europe; Orient Research, Far East; and directly from Fabri-Tek/Data Recall.

See us at Booth No. 345, National Computer Conference.

FABRI-TEK INC.
COMPUTER PERIPHERALS MARKETING
5901 South County Road 18 • Minneapolis, MN 55436 (612) 935-8811
Leader in Memory Technology for Over a Decade

MEMORY SALE

Short term leases/low prices

Expand your S/360 capacity now

CORE AVAILABLE FOR
Model 30
Model 40
Model 50
Model 65
Model 67

RCC

Call Bob Bardagy (203) 661-4200 at
Randolph Computer Company
537 Steamboat Road
Greenwich, Connecticut 06830

Make promises you can't keep? Meet LAYLA.

Do overdue jobs result in dissatisfied customers and lost revenue? Proper scheduling can change all that.

LAYLA is a computer program designed to schedule available manpower to projects. It's features are:
- Fortran IV program for use on most systems.
- Real schedule from existing manpower.
- Optimization of schedule whenever necessary.
- Simultaneous scheduling of multiple projects.
- Easy to use. Efficient. Cost and time saving.
- Variety of output reports (inc. graphical reports).

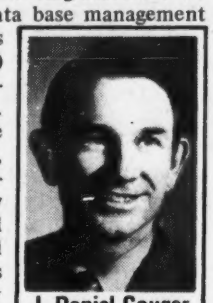
LAYLA is a computer aid that every cost conscious manager should consider. For information contact:

ECI Software Corp.
87 Crescent Road
Needham Hts., Mass. 02194
Tel: (617) 449-4140

Instruction Guide Shows

Teaching Materials for DBMS Lagging

A mixture of disappointment and delight occurred in my preparation of the 7th edition of the *Guide to Audio/Visual Instruction for Data Processing*. The delay in producing materials for teaching data base management systems (DBMS) was disappointing. On the other hand, some excellent new material plugged other gaps in the array of instructional material: a unique course on interpersonal skills for DP managers, several VS2 courses, a CICS course, two new applications courses and several needed modules for the system analysis and design courses.



J. Daniel Couger On Education

Sales of the media producers expanded rapidly last year, despite the reduction of spending in many areas of data processing. Of the "Big 3" (Advanced Systems, Inc. (ASI), Deltak, Edutronics), one reported a sales increase of 40% over the prior year; another, an increase of 25%.

The customer base expanded in both academia and industry. Customer lists of the media producers include more than 100 universities and 100 community colleges.

New Data Base Courses

The educational media industry is responding to the surge of interest in data base technology. ASI, Deltak and Edutronics now have general data base courses.

However, none of them has been willing to commit resources to specific data base management systems. Such a posture was understandable in respect to IMS, the highly complex IBM product. The media producers were slow in recognizing the widespread move to IMS and are compounding the delay by waiting to proceed until IMS/VS becomes clarified. The independent vendors aren't alone – IBM hasn't produced an IMS course either.

The delay in producing courses on other DBMS is enigmatic. Two data base systems, Total and Adabas, have had multimillion dollars in sales, according to *ICP Software Newsletter* (January 1974). The same publication shows that Mark IV and Asi-st, file managers that have been interfaced with DBMS, also have had multimillion dollars in sales.

Of the "Big 3" media producers, only Edutronics appears to be near to producing a course even somewhat related to DBMS; a Mark IV course scheduled to be available in 1975. As could be expected, however, a small company has moved into the gap. First Computer Services, Inc., Charlotte, N.C., has produced an audio-visual IMS course.

Despite the lag in responding to the need for DBMS courses, the media producers released new products in other important areas this past year. Products recently available, or to be released in the next 90 days, are: DOS/VS Operator Training (ASI, Deltak, IBM), OS/VS2 Operator Training (ASI, Deltak, IBM), PL/I (ASI, Deltak, IBM) and CICS (Edutronics).

Profession-Oriented Courses

An example of the currency and quality of courses available is Deltak's new course on "Interpersonal Skills for DP Managers," which generated great interest at the national meeting of the American Society for Training Directors. Representatives of more than 125 companies witnessed the demonstration.

This unique course is built around the behavioral technique of Transactional Analysis, popularized by Michael Harris' book, *I'm O.K. – You're O.K.* It is used for both individual and small group training situations. I'll be using this Deltak course for one of my classes this fall – it is useful for both the industrial and academic environments.

I also class-tested Edutronics' new Data Communications and ANS Cobol Efficiencies courses this past semester, with excellent results. The newly released Edutronics' user-oriented course "Computer System Fundamentals" is comprised of 20 modules from other courses and a new manual. These materials will be used in functional-area courses in our undergraduate and graduate courses next fall.

ASI added two more courses to its well-received applications series: Purchasing Management and Techniques and Capacity Planning and Shop Floor Control. The latter was developed by Ollie Wight, a very successful instructor as proven in prior manufacturing-oriented applications in multimedia courses by ASI.

In response to my question about forthcoming products, Dave Napper, manager of independent study program development, gave the stock IBM answer. The company policy is not to provide preliminary product announcements in any product area. However, the doubling of its product line in one year indicates IBM's new emphasis in multimedia courses. When asked if the company plans to market general education courses (e.g., a course in system analysis and design), Napper responded that the principal thrust would be courses to support specific product lines.

John DeAno, vice-president for product development, reports that ASI courses available in the next quarter include: VS 1/2 System Service (utilities, linkage editor, dumps, etc.), DOS/VS JCL, DOS/VS Concepts and Facilities, Computer Operator Training for System 370 and VSAM.

Robert King, president, reports that Deltak is expanding its system series, to be available in August and September. He was evasive on answering the question on IMS/2, but implied that such a course was on the drawing boards. Products to be added to the Deltak line in the next 90 days include: DOS/VS for Operators, OS/VS2 for Operators, OS/VS2 Debugging and PL/I Programming.

Pat Sorrentino, vice-president of product development, reports that Edutronics' data control course and a course on programming in a VS environment will be available in 1974. Executing programs in VS and VSAM courses are also scheduled for 1974. The data communications course will have three added modules for the third quarter.

Ben Graves, president, reports that Data Processing Education Network (DPEN) has changed its marketing strategy this past year. For the near future, the company will market its products in the eastern half of the U.S. using a vertical border from Illinois to Kentucky to Florida: "We've pulled in our horns in marketing to better serve our existing customers."

The 7th edition of the *Guide to Audio/Visual Instruction for Data Processing*, can be purchased for $3 from *Computing Newsletter*, University of Colorado, Cragmor Road, Colorado Springs, Colo. 80907. (The cost is $4 if an invoice is required.)

Couger is professor of computer science and management at the University of Colorado.

What's The Outlook For The Computer Industry In

JAPAN

NOW... And In The Crucial Months Ahead?

Timely *FREE* SPECIAL REPORT

Answers These And Other Vital Questions About The Fast-Changing Japanese Computer Industry!

Japan is the largest computer market outside the U.S. with over 15,000 computer installations worth $5 billion and projections indicate the Japanese market will grow 25%-30% a year.

BUT...

- What about the effects of the current energy crisis on Japan's computer industry?
- Will the relaxed restrictions on Arab oil supplies to Japan and the fact that Japan has exempted data processing from oil restrictions mean no cut in computer activity?
- How about the impact on mainframe makers? Investment restrictions? Japan's credit squeeze? Power cuts? Effect on computer production? Commodity shortages? Replacement demand? The effect on Japan's economy? U.S. imports and exports from and to Japan? What it all means to YOU?

As an alert executive aware of the growing importance of the *international* computer industry, *now* more than ever, you need.

EDP Japan report

The bi-monthly newsletter *Airmailed* to you from Tokyo to keep you informed of the rapidly expanding, changing Japanese computer industry.

You Are Invited To Accept This SPECIAL TRIAL SUBSCRIPTION OFFER

3 Months For $20

Saving $4.50 On The Regular $98 Annual Rate

INCLUDING THE *FREE* SPECIAL REPORT!

EDP Japan report

Published in Japan By International Consulting Corporation An Affiliate Of

INTERNATIONAL DATA CORPORATION
Publishers Of COMPUTERWORLD
60 Austin Street, Newtonville, Massachusetts 02160

Please send me *EDP Japan Report* for the next three months (6 issues) for only $20, a saving of $4.50 on the regular $98 annual rate. Include, without extra charge, your 12-page Special Report, *"Effect Of Oil Crisis on Japan's Computer Market."*

☐ Bill company ☐ Bill me ☐ Check enclosed ☐ Purchase order enclosed

Signature _____
Name _____
Title _____
Organization _____
Address _____
City _____ State _____ Zip _____

SHORT TERM
360 LEASES
ROCKWOOD
Computer Corporation

33 W. Tarrytown Road
Elmsford, New York 10523

CALL TOLL FREE
800·431·1781

TO FIND THE OFFICE NEAREST YOU

Use Qantel Mini-Based System

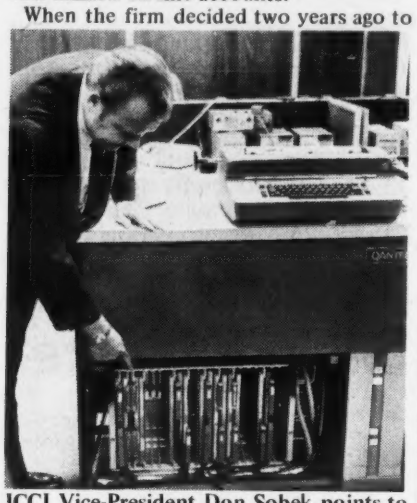
Firm Centralizes With On-Line Banking Terminals

By Patrick Ward
Of the CW Staff

SHAWNEE MISSION, Kan. – Moving towards centralization has brought Inter-Continental Computing, Inc. an unexpected benefit: the ability to service a wider variety of terminal types, and therefore a larger group of potential customers.

The company has been processing transactions on-line for its mostly savings and loan and credit union customers since late 1967 and now handles about one and a half million on-line accounts.

When the firm decided two years ago to centralize its operations, it had a Los Angeles branch with three Burroughs B500s handling processing in that area, a Houston branch with one B500 and another B500 at headquarters here.



ICCI Vice-President Don Sobek points to the line adapter boards inside a multiplexer box at the firm's Shawnee Mission headquarters. The boards, controlled by microprocessors in a Qantel minicomputer concentrator, help give the firm the ability to service different types of terminals.

The purpose of centralization was to bring the company's best technicians to one site, to save on duplications of software development and to reduce overall costs, said Don Sobek, executive vice-president.

Centralization, he added, would also make it less expensive for the company to expand its service into new areas, since investment in any new branch office would be smaller.

Mini Concentrators

ICCI's centralization has meant placing a Qantel Answer 6 minicomputer concentrator at each of the company's three sites, plus putting in another Qantel Answer 6 as a front end to a 270K Burroughs B3500 at headquarters here.

The three Qantel concentrators are equipped with multiplexer boxes which adapt the line disciplines of incoming messages from various terminals. With further conversion done in the front end and in the B3500 itself, ICCI is already able to service Burroughs B606 bank teller terminals and TC-700 terminals, Olivetti TC 380s and TC 349s, and is "about halfway in with the NCR 270," according to programming director Chuck Budd.

When ICCI relied solely on the branch offices' B500s to do on-line processing, the firm could support Burroughs terminals and no others, Sobek recalled.

ICCI's salesmen, like their competitors, had to persuade prospective customers to use their vendor's equipment, "just because our service could only be utilized through it," Sobek said.

The problem became easier to resolve with the Qantel systems and the B3500. Input from various terminals is not transparent to the B3500, but "it is close," Budd noted, "and similar terminals, especially programmable terminals, can be made . . . transparent."

Since February of this year, a Qantel Answer 6 at the Los Angeles site has been controlling two hardwired multiplexer boxes, one handling 10 phone lines, the other seven.

Customers in the area use the full range of terminals ICCI supports to enter data asynchronously at speeds up to 1,200 bit/sec.

Each multiplexer box in the Qantel system contains up to 12 line adapter boards controlled by a 2K microprocessor in the Qantel system, Budd explained. A third microprocessor drives the outgoing data stream through International Communications Corp. modems at 7,200 bit/sec synchronous over full-duplex leased lines to the Qantel front end here.

User Casebook

The Los Angeles system's main memory could also be used to control the line adapter boards, Budd mentioned, but is primarily used to drive peripherals.

The Answer 6 can print reports from tape, read cards and transmit them on-line, and also provide control functions.

At the central site, the Qantel front end polls the three lines from the concentrators and sends the stream of data to the B3500 which writes its output simultaneously on disk and tape.

Either tape or disk is processed at night and reports for hard-copy output are sent back to the branch Qantels to be printed and mailed from there.

ICCI now processes about half of its accounts through its centralized system and expects to convert fully to it by the third quarter of this year, Budd stated. The Los Angeles office, which had nine systems and programming staff members, is now down to three, and even fewer people may be required, he noted.

Once the company is fully on the centralized system, Sobek said expenses should be 20% to 25% less than they would have been with the previous system.

Though proud of his company's centralization program, Sobek called it "a tremendous undertaking" that ran a year behind schedule. He also mentioned that his firm has about 20 systems and programming people with about 140 collective years of programming experience among them, half of it in on-line work.

TI Adds Clustered System, Portable Teleprinter

HOUSTON – Texas Instruments has added a processing terminal system to its line of minicomputer equipment. The terminal system consists of one to eight TI Model 913 video display terminals connected to a processing controller arranged in a cluster configuration.

The Model 913 terminal features a 12-in. diagonal nonglare screen, programmable cursor positioning, protected display fields, processor control functions, a selection of detachable keyboards and a private refresh memory. The 960-char. display features alphanumeric and special characters arranged in a 12-line by 80-char. format.

The programmable cluster terminal processor typically assumes control of the operator/terminal dialog, thus providing operator prompting and dialog techniques that are impractical with conventional terminals, TI said. In addition, the cluster terminal controller directs communication activity, and offers error detection and recovery as well as adaptability to a variety of circuit disciplines and transmission codes. A synchronous and asynchronous modem (or a combination of modems) can be supplied as an integral part of the cluster controller.

Other communications abilities include optional auto-call and auto-answer modules for both Touch-tone and pulse dialing. These features can be used to relieve the operator of establishing a connection with a host system when the public dial network is used for communication, the firm noted.

TI has also introduced the Model 735 portable data terminal.

Weighing under 25 lb, the unit will fit under commercial airline seats and includes a full Usascii keyboard with upper/lower case and an auxiliary EIA RS 232C interface capability, which allows an external device such as modem or a cassette tape transport to be interfaced to the keyboard/printer or the acoustic coupler.

Additionally, the Model 735 offers users switch-selectable operation at 10-, 15-, or 30 char/sec speeds, half- or full-duplex communication, and single- or double-line spacing.

The price for the Model 735 portable terminal is $2,595; lease rates range from $95/mo to $140/mo, including maintenance.

In conjunction with the addition of the new Model 735, the earlier Model 725 price will be reduced to $2,495 from $2,780. Effective Nov. 1, the company will no longer produce new units of the Model 725. However, TI will continue to offer the Model 725 for purchase or lease as used equipment on an "as available" basis and will continue full spares and service support for its customers. TI's address is P.O. Box 1444, 77001.

AT&T/MCI—The Beat Goes On

WASHINGTON, D.C. – The FCC has ordered AT&T and the Bell System operating companies to provide MCI and other specialized carriers with FX and CCSA private line facilities "on a nondiscriminatory basis." The order was the latest in the continuing legal saga concerning the private line facilities.

Bell was given 10 days to comply and it was ordered to "cease engaging in any conduct which results in denial of or unreasonable delay in establishing" the required connections.

The move was hailed by MCI as removing any doubts that competition is here to stay and that users will now receive the services they want and need.

AT&T in turn again went to court petitioning the U.S. Third Circuit Court of Appeals in Philadelphia for a review of the FCC order. Only days earlier, the court had ruled that the issue should be decided by the FCC.

Bell's petition called the FCC ruling "arbitrary and capricious" and said it rested on "premises that are neither rational nor supported by substantial evidence. Several days after the petition for review, Bell asked the court for a stay of the FCC order.

One industry source close to the continuing legal moves said the attorneys for both sides seemed to be the main beneficiaries of additional legal challenges.

"The AJ 841 has proven itself in many direct comparisons with other terminals as the most reliable Selectric-based terminal on the market. We are steadily gaining customers on the basis of our outstanding performance and reliability."
Gerard W. Schoenwald, Director of Marketing

With the AJ841 you get MORE than a Reliable Selectronic™ Terminal.

Look at what the AJ 841 Selectronic Terminal has to offer—a heavy-duty IBM Selectric printer mechanism, plug-in circuit card electronics, plus . . . a two-character buffer for error free typing, a built-in modem, and the most attractive styling of any printer available.

But, look what's behind the AJ 841 design—engineering and manufacturing know-how that assures AJ quality, our own sales and service staff in over 30 cities, and the option to buy or lease . . . direct from us.

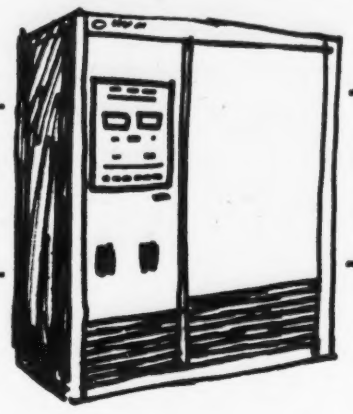
We also offer non-impact printer terminals, teletype terminals, cassette recorders and a variety of couplers and modems. Why not let us show you that we're . . .

Advertising Dept., Anderson Jacobson, Inc.
1065 Morse Ave., Sunnyvale, California 94086
☐ Send me the AJ 841 brochure
☐ Send me info on your other terminals
☐ Have someone contact me
NAME
TITLE
COMPANY
ADDRESS
TELEPHONE

More than a terminal company
Anderson Jacobson
1065 Morse Ave. ■ Sunnyvale, CA 94086 ■ (408) 734-4030
Sales offices in principal cities throughout the U.S.A.

415 cycle computer power

all solid state



input
60 cycle
utility power

output
415 cycle
transient-free power

Every year more CPU's require 400 cycle power. Now IBM's 370/165 and 370/168 join the 360-85 and 195 in utilizing 415 Hz power joining various CDC, GE and Univac models. Typically, motor-generator conversion units have been employed to provide the higher frequency, but Avtel offers all solid-state converters with superior performance, lower operating costs and reliability ten times as great as rotating devices. Available in redundant and non-redundant configurations, Avtel's solid-state converters are also quiet, efficient and easy to install. Most models are convertible to Uninterruptible Power Systems (UPS) if desired. All models are fully compatible with computer power requirements. For further information, prices and leasing terms contact:

AVTEL
CORPORATION
an Airtronics Subsidiary

1130 EAST CYPRESS STREET · COVINA, CALIFORNIA 91724 · PHONE (213) 331-0661

Singer Supermarket POS System Based on 940 Intelligent Terminal

NEW YORK – The Singer Co. has entered the supermarket point-of-sale area.

The Singer system features a modular approach that allows food retailers to tailor exact configurations to meet immediate needs, and then upgrade to Universal Product Code (UPC) scanning when source labeling and in-store marking techniques make this mode feasible.

The key component of the Singer system is the Model 940 electronic terminal, which can operate initially as a freestanding cash register and later be field-upgraded to collect and control data required for a front-end operation and a backroom management system.

The Model 940 is an intelligent, programmable terminal that performs the basic point-of-sale functions. It extends price, calculates tax, displays amounts, accepts payment, figures change and gives descriptive receipts. The keyboard has 10 numeric and 16 functional keys that guide the checker through the correct operating sequence. Terminal capabilities include 11 programmable departments and 44 stored totals.

A special reverse key is used to correct over- or under-rings, department and amount entry errors, or issue credit refunds for returned merchandise or bottles.

Optional attachments for the terminal include a remote cash drawer, electronic scale, change dispenser and remote customer display. The Model 940 terminal is "base priced" at $3,200.

When a supermarket is ready to upgrade to an in-store management system, a Singer computer is added to collect and combine all transaction data from up to 64 store checkout terminals, accumulate department and checker totals and balance cash drawers.

For a complete inventory control and management system, the supermarket adds UPC scanners and a second computer to perform automatic price lookup. Both computers are fully compatible and are connected by a failure monitor for mutual backup and assistance during peak activity hours.

The system reportedly can eliminate 15% to 20% of a store's check lanes and save up to 40% in checker labor.

Delivery of "production units" is scheduled for the second quarter of 1974 from 30 Rockefeller Plaza, 10020.

Comsat Files for Digital Service

WASHINGTON, D.C. – Communications Satellite Corp. (Comsat) has filed proposed rates with the Federal Communications Commission for a medium-speed digital data satellite service called Digisat.

The data service, initially for service between the U.S. mainland and Hawaii, will make available digital data channels at speeds of 2,400-, 4,800-, and 9,600 bit/sec. The service is designed for use by international common carriers.

The proposed monthly rate for a digital data satellite circuit between the U.S. mainland and the Hawaiian earth station will be $2,700 for 2,400 bit/sec, $3,100 for 4,800 bit/sec and $3,900 for 9,600 bit/sec.

Expansion of Digisat to European points is expected later this year after completion of tests between the U.S. and several European countries, Comsat said.

If Data Communications is part of your future, then this unique seminar should be on your schedule.

If you're now involved in Data Communications (or will be soon), we'll help you learn the ins and outs of the data communications field.

This is the seminar that wraps it all up for data communications users. It's called *Data Communications – The Executive Imperative*, and it covers both fundamentals and applications-oriented subjects ranging from transmission theory to terminal selection techniques. It gives you what you need to know to plan effective communications systems in two busy days. And that's saying quite a lot. Because data communications is a complicated area with many problems for the user. Proper planning is a must. And this seminar tells you how to go about it.

Some of the things you'll learn:

- Basic terminology of the field.
- Tariffs and cost-savings.
- Effect of transmission problems on a network.
- The modem – how it works and what it does.
- Terminals and their performance.
- Multiplexing and data concentration.
- Line-control software.
- Network organization and design.
- How to upgrade to a bigger system.

Free reference materials and continuing updates

As a participant in the Data Communications Seminar, you'll receive a valuable set of reference materials prepared by the ICC Institute. These materials include a comprehensive 2-volume looseleaf outline of all course materials, a copy of "Data Modem Selection and Evaluation Guide" by Vess V. Vilips, a "Data Communications and Teleprocessing Dictionary" and a line-cost calculator.

And that's just the beginning. You'll also receive free update materials for afull year! This is more than just a seminar. It's a continuing reference service as well.

Seminar Leader is Dr. Dixon Doll, a highly respected teleprocessing consultant

Dr. Dixon Doll leads the expert faculty at this seminar. He has his Ph.D. in Systems Engineering from the University of Michigan and many years of experience in this field as a consultant and educator. He has performed work-study with communications techniques at M.I.T., taught graduate-level computer systems design, and has served as professional consultant to such firms as IBM, Raytheon, ICC and MCI. Dr. Doll is in charge of our faculty of experts, and takes an active part in the entire seminar.

You should attend this seminar, if . . .

- You are currently involved in data communications on a management or operational level and wish to expand your knowledge of the field.
- Your company will be going into this field in the near future.

Charges and Enrollment

The total cost for this two-day seminar is $350, including workbook, reference materials, year-long update service, luncheons and continental breakfasts. This cost does not include hotel rooms, if necessary.

To enroll, look over the schedule below, fill out the coupon and send it in. Remember, enrollment must be limited, so don't wait until it's too late!

Data Communications, The Executive Imperative

Course materials and outline prepared by the ICC Institute.

THE EDP SEMINAR SERIES
SPONSORED BY COMPUTERWORLD

To: Walter Boyd, Executive Vice President, Computerworld, Inc.
797 Washington Street, Newton, Massachusetts 02160

☐ Reserve ____ place(s) at your Data Communications Seminar for the city and date(s) checked and send a copy of your descriptive brochure.

☐ Check enclosed ($350 per person) ☐ Purchase Order enclosed

☐ I'd like to attend the seminar I have checked, but cannot make a reservation now. Please send your brochure. I understand that enrollment is limited.

Check City:		
☐ Chicago	June 3-4	Water Tower Hyatt House
☐ New York	June 10-11	Americana
☐ San Francisco	June 17-18	St. Francis
☐ Orlando	July 1-2	Royal Inn (Lake Buena Vista)
☐ San Diego	Sept. 30–Oct. 1	Town & Country
☐ Washington, D.C.	October 7-8	Loewe's L'Enfant Plaza
☐ New York	October 14-15	St. Moritz
☐ Chicago	November 4-5	Water Tower Hyatt House
☐ Miami	December 2-3	Miami Marriott (N.W. 42nd St.)

Name _____

Title _____ Telephone _____

Company _____

Address _____

City _____ State _____ Zip _____

Private Systems Seen a Threat To Canada's Nets

By T.M. Whiteman
Special to Computerworld

TORONTO, Ont. – The effectiveness of Canada's telecommunications networks in the future could be jeopardized by the proliferation of private computer communication systems, according to Brian Hewat, assistant vice-president of the computer communications group, Bell Canada.

He said the country is at the fork in the road in terms of computer communications and "we must choose which direction to follow.

'Intelligent' Concept

"Down one path lies a rational, efficient and economic information transfer system that can serve all Canadians based on the 'intelligent' network concept," he said. "This concept is being developed by Bell Canada and is a network that links many different types of terminals and computing equipment to perform a number of computer communications functions.

"Down the other path lies the possibility of an uncoordinated and economically wasteful non-system that could result in a situation more chaotic than what we see developing in the U.S.," he said.

Speaking to the Association for Systems Management here, he said many Canadian business organizations, especially the large national banks with hundreds of branches each, are on the verge of deciding what information systems they require and they will likely commission systems to meet their needs.

Hewat said a proliferation of private systems would be wasteful duplication of facilities and be wasteful of capital resources. There would also be demands for the eventual interconnection of these private systems, which would then be very difficult to and costly.

Could Be Disastrous

He pointed to the U.S. telecommunications scene where there is a proliferation of competing carriers, many of them locked in legal struggles. Such a situation would be disastrous for Canada, he said.

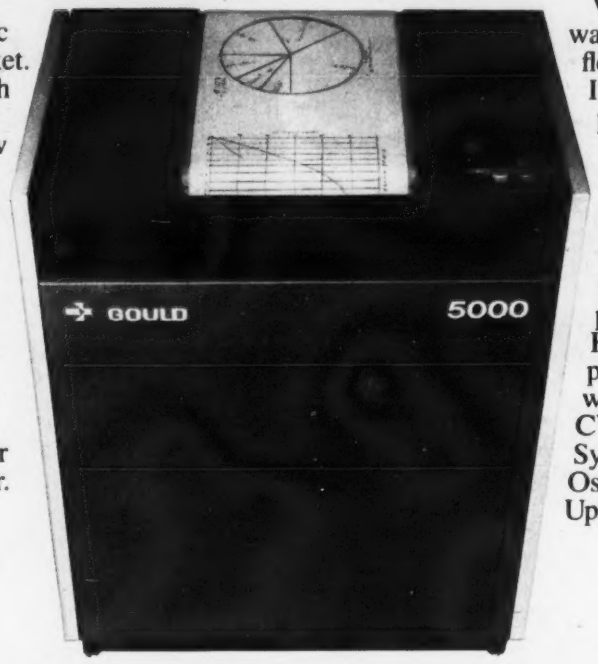
Hewat's organization is planning a shared-use "intelligent network" which uses packet switching technology, in which all information is converted into uniform sized packets for more efficient transmission, he noted.

It's everything you've ever wanted in a peripheral for your mini. With a price/performance ratio superior to every other electrostatic printer/plotter on the market.

In fact, the Gould 5000 gives you 1600 lines per minute – and that's more than any other electrostatic printer/plotter on the market.

That means you get high speed for improved mini throughput efficiency. Low cost for economic justification. And, of course, high reliability backed by Gould's reputation for quality.

But you also get a lot more. Resolution of 100 dots per inch. Full alphanumeric and graphic capabilities. 132 characters per line. A 64 ASCII character set. Fan fold and roll paper. 8 bit wide data path.



Optional features? The Gould 5000 is loaded. 96 ASCII character set, upper and lower case. 128 ASCII character set custom designed to your requirements. On-line mini-computer and off-line magnetic tape interfaces.

What's more, Gould software is the most efficient and flexible available anywhere. It lets your mini print and plot considerably faster than competitive units.

We say that the new Gould 5000 is the best buy on the market, with the best features of any mini-computer printer/plotter. And our Pete Highberg or Bill Koepf can prove it to you. Get in touch with them now at Dept. CW5, Gould Inc., Data Systems Division, 20 Ossipee Road, Newton Upper Falls, Mass. 02164.

The new Gould 5000. It's the fastest printer/plotter ever designed for mini-computers.

See us at the Computer Caravan in your area or at Booth No. 1021, National Computer Conference, Chicago.

DATA SYSTEMS DIVISION

GOULD

COMPUTER TERMINALS ARE TALKING!!!!

Hear what the Computer has to say!
Call or write for a demonstration.

Have you heard TransCom's Audioport™ give:

1. Stock status for order entry
2. The shipment history for shipment tracing
3. Parts and tool locations for shop control
4. Many other data entry/retrieval applications

The Audioport™ Features

. . Flexible keyboard – alpha, numeric and special function keys
. . Portability – take it anywhere
. . Low cost – under $500 purchase
. . Compatibility – with most major audio systems

TransCom Inc.
580 Spring Street
Windsor Locks, Conn. 06096

☐ Send me the Audioport Brochure
☐ Let me hear what you have

Name _____
Title _____
Company _____
Address _____
_____
Telephone _____

TRANSCOM INCORPORATED
a subsidiary of
HI-G, INCORPORATED
580 Spring Street
Windsor Locks, Conn. 06096
(203) 623-2481

Recurring Computer Nightmare #8

The day Sweetheart Bakeries had a big run on cupcakes.

Blame it on sunspots or maybe a worn tapehead. The fact remains, when computer errors hit your production line, it could end up costing you a lot of dough.

What you need is a way to cut the possibility of these errors down to a bare minimum. And the best time to start is when you place your next order for computer tape. Just specify BASF.

At BASF, we produce tapes that are a lot better than they have to be. For example, we run a continual check on the quality of our tape coating . . . so, no matter what your recording density, you can count on a constant reading voltage.

One more point. Our tapes don't cost any more than the competition's. You're already paying for BASF quality . . . you might as well have it. Write today for the complete story of how BASF computer tapes stack up against the competition. Remember, nobody makes better tape than the people who invented it. BASF Systems, Crosby Drive, Bedford, Mass. 01730.

When it's BASF...you know it's

BASF

not the tape that goofed.

THE RESTORE TIME FAST DUMP
DATA INNOVATION
CORRECTIONS SET

Phone or write for a free 30-day trial or more information

INNOVATION DATA PROCESSING
925 Clifton Avenue
Clifton, NJ 07013
201—777-1940

Line Interfaces Key to Mini Front Ends

By Patrick Ward
Of the CW Staff

BOSTON – Users evaluating minicomputer-based front-end processors should pay a lot of attention to the kind of line interfaces the minis support, William G. Gallagher, manager of systems and programming at Savings Management Computer Corp., (SMCC) told a Computer Caravan workshop here.

Gallagher spoke from experience. His firm handles four million accounts for a data file of 43 banks and processes about 100,000 on-line transactions a day with two- to three-second response times.

Presently the firm runs 15 1,200 bit/sec asynchronous lines supporting over 280 terminals, including 43 IBM 2980s, 169 Financial Data Services teller terminals and 70 Bunker Ramo 2206 CRTs.

Additionally, there are 168 150 bit/sec lines supporting 235 IBM 1060 terminals.

A year ago the company was moving to new headquarters and decided to convert from one IBM 360/50 using two IBM 2703s and a Bunker Ramo 2228 controller to two Model 50s and two Digital Equipment Corp. PDP 11/20 programmable front ends.

The two 512K IBM CPUs operate under DOS. Each dedicates 420K to the TP work.

SMCC went to the mini front ends to reduce CPU overhead, Gallagher remarked, but while the company had been told that one of the mini front ends "could handle our entire load, . . . it turned out that one machine couldn't handle half," he said.

User Casebook

SMCC had put in two minis to provide for both redundancy and growth, but even when the two minis were splitting the workload they couldn't handle the existing amount of traffic, Gallagher said.

The mini implementation was to consist of an emulation phase, and a second "full-blown front-end" phase where all the Btam overhead would be transferred out of the CPU.

But with throughput problems appearing in the emulation mode, SMCC never got to phase 2 with the minis and replaced them with Memorex 1270 and Bunker Ramo 2228 control units in January 1974.

The problem with the minis lay in their "bit banger" line interfaces, Gallagher said.

This was the only line interface available on the PDP 11/20 at the time, noted Robert Howe, manager of operations and communications for the firm.

A "bit banger" samples every incoming bit five times, with 40 interrupts to process every eight-bit character. The amount of data coming in to SMCC was just too much for this type of interface to handle, Gallagher stated.

An alternative type of line interface, he said, is the character assembler, which samples each byte only once. Even better is direct memory addressing (DMA) with only one interrupt per message segment. However this type of line interface can be very expensive on a mini, Gallagher pointed out.

Ask for Benchmark

So instead of asking a manufacturer just about a mini's cycle time – which is only one index of a machine's capability as a front-end processor – a user should spell out the configuration he is planning and ask the vendor for a benchmark.

The user should get a benchmark figure based on the particular line interface configuration; the number of lines and their bit/sec rate; the environment, autopoll or other; the error functions and so on.

A user might also ask about adding core or ports and be assured there is a bus extender available, but the user should ask the vendor about "limitations on extending the bus, how the time on the bus degrades when you extend it and so forth."

The two hardwired Memorex 1270s which replaced the minis "are nice pieces of equipment but they don't give us the flexibility a front end would," Gallagher observed.

"No hardwired device can remove the overhead that we want," he continued. SMCC will go to a mini front end eventually, because a front end would make new terminal interfacing easier, would take overhead from the CPU and offer more diagnostics.

Gallagher added that he is looking for a device that can provide a standard text mode across the 360 channel by converting text as well as the "envelope" surrounding it.

"When they don't convert text you have to upgrade all your application software for the support of that particular terminal," Gallagher noted.

Other things to consider in evaluating a mini, Gallagher said, are word size and memory addressing.

The 1130 was a fine idea for its time.
Time's up.

Introducing the Computer Hardware Inc. CHI-2130. A 16-bit, general purpose central processor with a basic cycle time of 800 nsec. Everything that the 1130 was, plus a heck of a lot more at three to six times faster. It also costs less.

Suppose you now have an 1130 on the floor. Pack it up and send it back. Every scrap of software in your house will run on the CHI-2130 without modification. That includes applications, diagnostics, the whole works. The only difference is speed — you'll be able to do more than twice as much work with the CHI-2130 as you were doing with your old 1130.

Suppose you're interested in communications. With the 2130's internal speed, supporting multiple high speed terminal, on-line order entry, remote batch, and interactive systems are all possible on the CHI-2130.

When you call in a representative from Computer Hardware Inc., you're going to be talking about savings of tens of thousands of dollars. And the sooner you and we get together, the sooner you'll begin saving. Start with our CHI-2130 brochure. It gives you all the facts in a straightforward way that any penny-pinching systems analyst can understand. Turn an ordinary year into something special. Make this the year of the CHI-2130.

CHI COMPUTER HARDWARE INC.

CHI Field Offices: New York, NY (212) 759-8885; Oak Brook, IL (312) 986-0141; Fullerton, CA (714) 871-2030; Tacoma, WA (206) 473-0505; Houston, TX (713) 665-7741; Anchorage, AK (907) 272-7074.

P.O. Box 4496, Sacramento, California 95825, (916) 929-8731

informer
computer terminals

Representatives wanted

See the smallest, lightest, most attractive CRT terminal at Booth 336–A; National Computer Conference

Open areas:

U. S.: Mountain States and Pacific Northwest
International: Japan, Germany, England, Scandinavia, Mideast, South America

CAR-MEL Electronics, Inc.
2218 Cotner Avenue
Los Angeles, California 90064
Phone: (213) 477-4216

SYSTEMS&PERIPHERALS

Bits & Pieces

Data General Tape System Operates at 75 In./Sec

SOUTHBORO, Mass. – Incorporating both a vacuum column and a tape cleaner, Data General's magnetic tape subsystem can have up to eight drives.

The drives operate at 75 in./sec with densities of 556- and 800 bit/in. on the 7-track model and 800 bit/in. on the 9-track version. The first unit of a system is priced at $9,900 and additional units cost $6,700 each.

Rewind speed is 200 in./sec. The units are software-compatible with other Data General tape drives and minicomputers.

Board Generates Video Graphs For Use With HP 2100 Minis

CUPERTINO, Calif. – Users of Hewlett-Packard 2100 minicomputers can directly plot graphs on standard television monitors with the 4406 graphic video generator from Intermedia Systems.

This single plug-in interface card contains over 64K bits of semiconductor storage to continuously refresh the entire TV raster without computer interaction. Every point on the screen is individually stored so there is no limit to the complexity of the display, other than the basic 256 by 256 resolution.

The solid state circuits generate composite video and synchronizing signals and provide three simple programmable functions – set a point, clear a point and clear the entire screen. The 4406 derives all required power from the computer backplane and provides a 1 V signal suitable for operating RS-170-type TV monitors.

The 4406 is priced at $2,750 from the firm at 20440 Town Center Lane, 95014.

Data Tablet Interfaced to Calculator

FAIRFIELD, Conn. – Summagraphics Corp. has developed an interface between its data tablet/digitizer and the HP 9800 series of calculators.

The data tablet digitizes graphical source data, enabling the calculator to compute distances, perimeters, areas and regressions.

Prices for digitizer and interface range from $1,750 to $4,400 from the firm at 398 Kings Highway, 06430.

Print Data on Metal Labels

MILWAUKEE – Users with applications for printed nameplates can computerize the printing of information with W.H. Brady Co. metalized or colored polyester film labels on fanfolded or roll stock.

The labels can be set up horizontally and have a special coating that is said to accept and retain the conventional ribbon ink. Each label is die-cut to customer specifications and has a pressure sensitive backing to provide permanent bonding on either flat or curved surfaces. The firm is at 750 S. Glendale Ave., 53201.

Electrostatic Plotter Now Adapted for IBM 360/370

By Vic Farmer
Of the CW Staff

NEWTON, Mass. – IBM 360/370 users considering electrostatic printing and plotting can now obtain a comprehensive software/hardware combination that can operate either on-line or off-line.

The Plotmaster system from Gould, Inc. attaches to the CPU's selector, byte multiplexer or block multiplexer channels, and can operate either in byte multiplex or burst mode on the multiplexer channel.

The system itself consists of a Gould 5000 (11-in. wide) or 5100 (22-in. wide) electrostatic printer, optional tape drive for off-line operations, a controller and software including a line printer driver and Plot software for the mainframe.

The Plot software takes any Calcomp drum or flatbed plotter applications, and using less than a 64K partition on the mainframe, recompiles, sectors and converts the plot for the forwarded-only paper movement required by the Gould printer/plotter. Normally plotters can backtrack and move around considerably over the paper. This resectoring does require the use of a disk through the mainframe, but Gould claims increased plot speed of up to 400 times.

The programs are written in machine language, but subroutines are callable in Fortran, according to Gould.

Using the basic printer software, the 5000 operates at 1,600 line/min and the 5100 prints 1,300 line/min. In addition, the 4820 printer which prints 3,600 line/min can be used.

Gould's Display language allows a business user to create business graphics such as pie charts, bar charts and line charts.

In the off-line mode, a 9-track 800- or 1,600 bit/in. read-only tape drive is used, and additional software is available so that users with Univac or Control Data computers in addition to their IBM CPUs can get more utility from the system.

A basic controller and printer system costs $20,400 or $615/mo on a three-year lease. The off-line system has a tape drive and costs $39,700 or $1,190/mo. One- and two-year leases are also available.

Gould is at 20 Ossipee Road, 02164.

Gould Plotmaster electrostatic printer/plotter attaches directly to IBM 360/370 computers.

For Microprogramming Power

Microprocessor Fits Into Mini

NEWPORT BEACH, Calif. – Data General Nova and Digital Computer Controls D-116 users can incorporate into their minis a microprogrammable processor that performs any microprogram process in parallel with the normal processing of the minicomputers and at substantially higher speeds, according to Educational Data Systems (EDS).

Using EDS' Micronova, typical speeds for four-word floating point decimal operations are up to 100 times faster than a Nova 1200 using software arithmetic, the firm said.

Occupies One Slot

The processor occupies one slot in the mini, and one or more Micronovas can operate on the data channel in parallel with the standard CPU of the Nova. The Nova initiates execution of a microprogram by an output instruction. Then the Micronova proceeds in parallel with the Nova CPU, accessing macros and data from the Nova core through the data channel.

Each Micronova has four 16-bit accumulators, up to 64 words (16 bits each) of random access memory (RAM), and up to 4K of programmable read-only memory (Prom). The Prom stores microprograms that are initiated by macros stored in either the mini's core or RAM. The RAM is used to store data and intermediate results as well as macroprograms that must be operated at very high speed.

Half-Byte, Byte and Word

The Micronova has half-byte, byte and word addressing modes which facilitate operations on decimal digits, bytes and full 16-bit words. It also has provision for handling two-, three- and four-word precision numbers.

When programmed as a floating point decimal arithmetic unit, the Micronova provides four precision options: one-word integers in the range ± 7999; two-word, three-word and four-word floating point numbers, giving six, 10 and 14 decimal digits respectively.

Applications

Suitable applications include floating point arithmetic, either binary or decimal, character string processing, graphics control, matrix operations, fast Fourier transforms, spectral analysis, sorting and control of special devices, according to the firm.

The availability of an assembler and the ability to operate microprograms from either the Nova's core memory or the Micronova's Prom facilitates the writing and debugging of microprograms, the firm noted.

The price of the Micronova is $3,000. Firmware is priced separately.

The floating point decimal arithmetic firmware that occupies 512 words of Prom, sells for $1,000. Delivery is 60 days.

Educational Data Systems is at 2415 Windward Lane, 92660.

TI Revamps 960 for 4K RAM

HOUSTON – Texas Instruments (TI) has revamped its 960A minicomputer to incorporate 4K random access memory (RAM) integrated circuits.

The 960B can have up to 65K of 16-bit memory incorporated into the main chassis, and this means users will not need to add a memory expansion chassis for this size memory, TI said.

The 4K RAM chips are used in plug-in sockets to ease replacement for field repairs, and an error detection and correction circuit can identify any failed parts, according to TI.

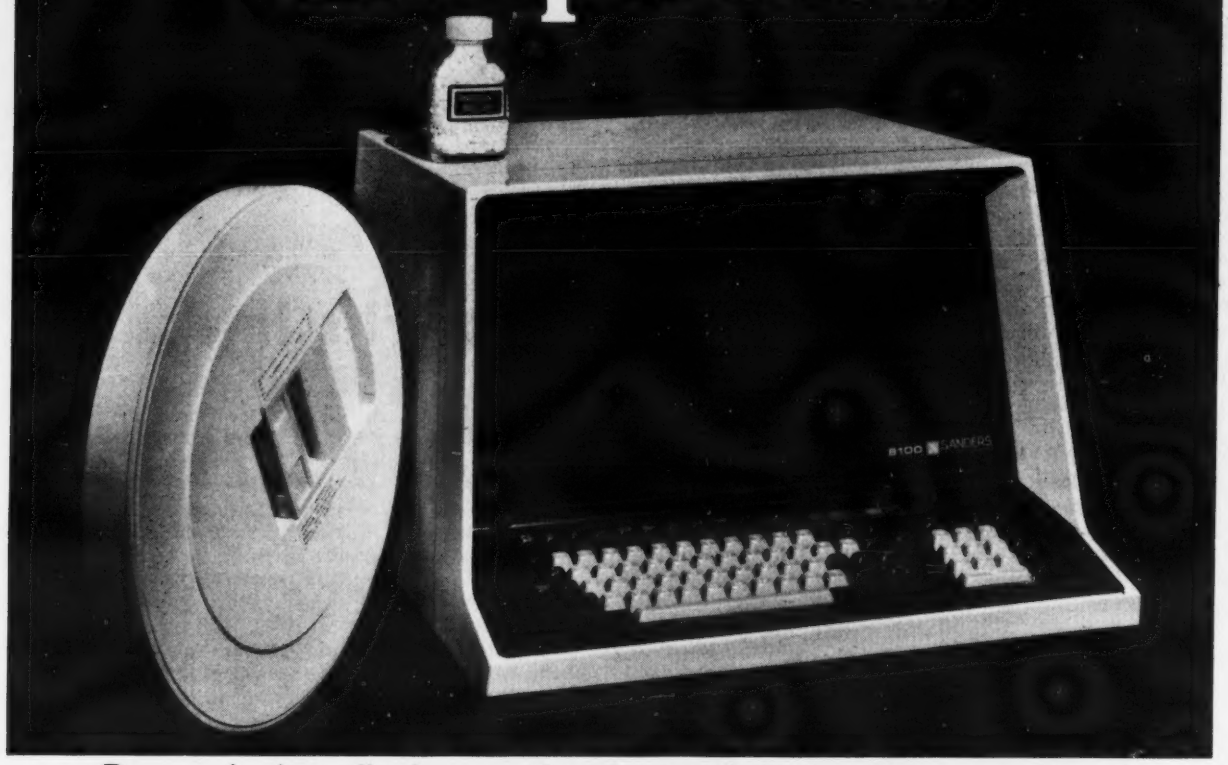
With this feature, a one-bit failure is automatically detected and corrected and multibit failures are detected for each 16-bit word processed through memory.

The 960B is software-compatible with the 960A.

A 960B with 8K of 750 nsec cycle time memory is priced under $4,000 in the rack-mounted version, and includes power supply, direct memory access channel, four communications register unit ports and automatic error detection/correction. Optional features include hardware multiply and divide, bootstrap loaders and a battery pack for memory protection and automatic restart.

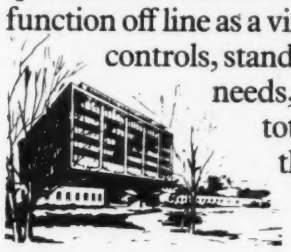
TI can be reached through P.O. Box 2902, 78767.

The 8100. Have a painless disk operation.



Remote-site data collection operations that are wholly dependent on mainframe processing can be painful and costly.

Sanders' clustered intelligent 8100 Remote Batch Terminal System can offer quick relief. With its 5-million-byte disk storage and IN-FORM software, it can function off line as a virtually self-contained computer system. It simplifies, controls, standardizes. It improves turnaround time, reduces labor needs, saves you money. From the leading company with total hardware, software and maintenance resources in the distributed data processing field. Sanders Data Systems, Inc., Daniel Webster Highway-South, Nashua, N.H. 03060. Call (603) 885-3727.



Sanders...the intelligent answer

European Sales Offices: Sanders Data Systems, Ltd., 51/53 Brick Street, London W1Y 7DU, England; Sanders Data Systems, GmbH, 6 Frankfurt am Niederrad, Rennbahnstrasse 72/74, West Germany.

Two Companies Offer Semiconductor Add-Ons for PDP-11s

Two manufacturers – Interactive Information Systems and Monolithic Systems Corp. – have introduced semiconductor memory for DEC PDP-11 minicomputers.

A PDP-11/45 can use an Interactive Information Systems IIS-75 with a 450-nsec cycle time and 350-nsec access time under DEC's RSTS or RSX operating systems.

A PDP-11/40 or below may use the IIS-85 with a 675-nsec cycle speed and 450-nsec access time. The systems contain their own power supplies and interfaces with the Unibus, and are expandable in 8K increments to 32K.

In the 32K maximum configuration, the IIS-75 is priced at $11,000 and the IIS-85 is priced at $7,860. The firm can be reached through P.O. Box 37403, 45222.

The Monostore III from Monolithic Systems also has a cycle time of 650 nsec and an access time of 450 nsec – a combination that boosts throughput by about 20% over conventional core memories, the firm said. The Monostore III in a 32K maximum configuration is priced at $7,500 from the firm at 2700 S. Shoshone, Englewood, Colo. 80110.

Turnkey System Supports Eight Hand-Held Terminals

MOUNTAIN VIEW, Calif. – Users with inventory and material control problems might find an answer in the Merlin 6000 turnkey system from Grubic Associates.

The 6000 uses up to eight hand-held terminals for information entry and display on up to 6,500 stock items. Automatic error checks are flagged to the entering clerk at the time of entry to reduce errors, and because the information is entered directly by the originating clerk, keypunch operations are eliminated.

The system reports short stock conditions and gives an audit trail of every transaction.

For $27,500, the user gets a 16-bit CPU with over 132K (words) of storage, one hand-held terminal, a teletypewriter with paper tape capability and dedicated software. Additional terminals are priced at $500 each. The firm can be reached through P.O. Box 1088, 94042.

Tape Drive Records at 800 Bit/In.

ROCHESTER, N.Y. – Sykes Datatronics, Inc. has an 800 bit/in. cassette tape drive, the Model 80, that is available with software and interfaces for several minicomputers, the firm said.

The drive is priced at $2,000 from the firm at 375 Orchard St., 14606.

New Compact 3M Cartridge Drive Takes the Crunch Out of Auxiliary Storage Costs

THE LITTLE LIBERATOR
MODEL 600 CARTRIDGE DRIVE

Booth 977 at the NCC

Now small size, low cost and high performance extras give you the edge in digital recording for communications terminals, minicomputers, point-of-sale systems, data gathering, and other applications which demand fastidious performance in minimum space.

The Qantex Model 600 uses the ¼", 4-track 3M data cartridge. Data is written at 1600 bpi, with 30 ips and 90 ips speeds. Data transfer rate: 48,000 bps. Complies with proposed ANSI standards.

Flexible control parameters and mounting. Miniscule front profile (3⅛"H and 7"W) makes it ideal wherever front panel space is at a premium.

Integrates beautifully in OEM systems. Stripped down or with complete range of options: with or without electronics; custom bezel for your corporate ID; four optional LED status displays. OEM quantity prices less than $300.00.

For complete information, call or write immediately:

Qantex
The peripherals division of North Atlantic Industries, Inc.
200 Terminal Drive, Plainview, New York 11803
Phone (516) 681-8350.

OEM Products

(While equipment in this column is primarily for Original Equipment Manufacturers (OEMs), in most cases it is also available in single units to interested users. Further, while much of this equipment is not presently available as such to the end user, it does give some indication of techniques and products that may be incorporated into end-user equipment.)

Tape Spooler Added To Paper Tape Reader

SAN GABRIEL, Calif. – Addmaster Corp.'s Model 650 paper tape handler is a spooler designed for use with the Model 601 paper tape reader.

The spooler reads step-by-step on external command or will run at 150 char./sec. The reader/spooler combination stops on character and has automatic end-of-tape and broken-tape sensing.

Prices for the tape handler range from $321 and the readers are priced from $175. The firm is at 416 Junipero Serra Drive, 91776.

Kennedy Formatter Is Ansi-Compatible

ALTADENA, Calif. – The Model 337 Ansi-compatible tape formatter from Kennedy Co. reads and writes 1,600 bit/in. phase-encoded data on the 1/4-in. 3M cartridge. Control functions have been designed to minimize complexity of the computer interface, however, the firm said.

Priced at $1,000, the formatter is available from the company at 540 W. Woodbury Road, 91001.

EPI Has Data Loader

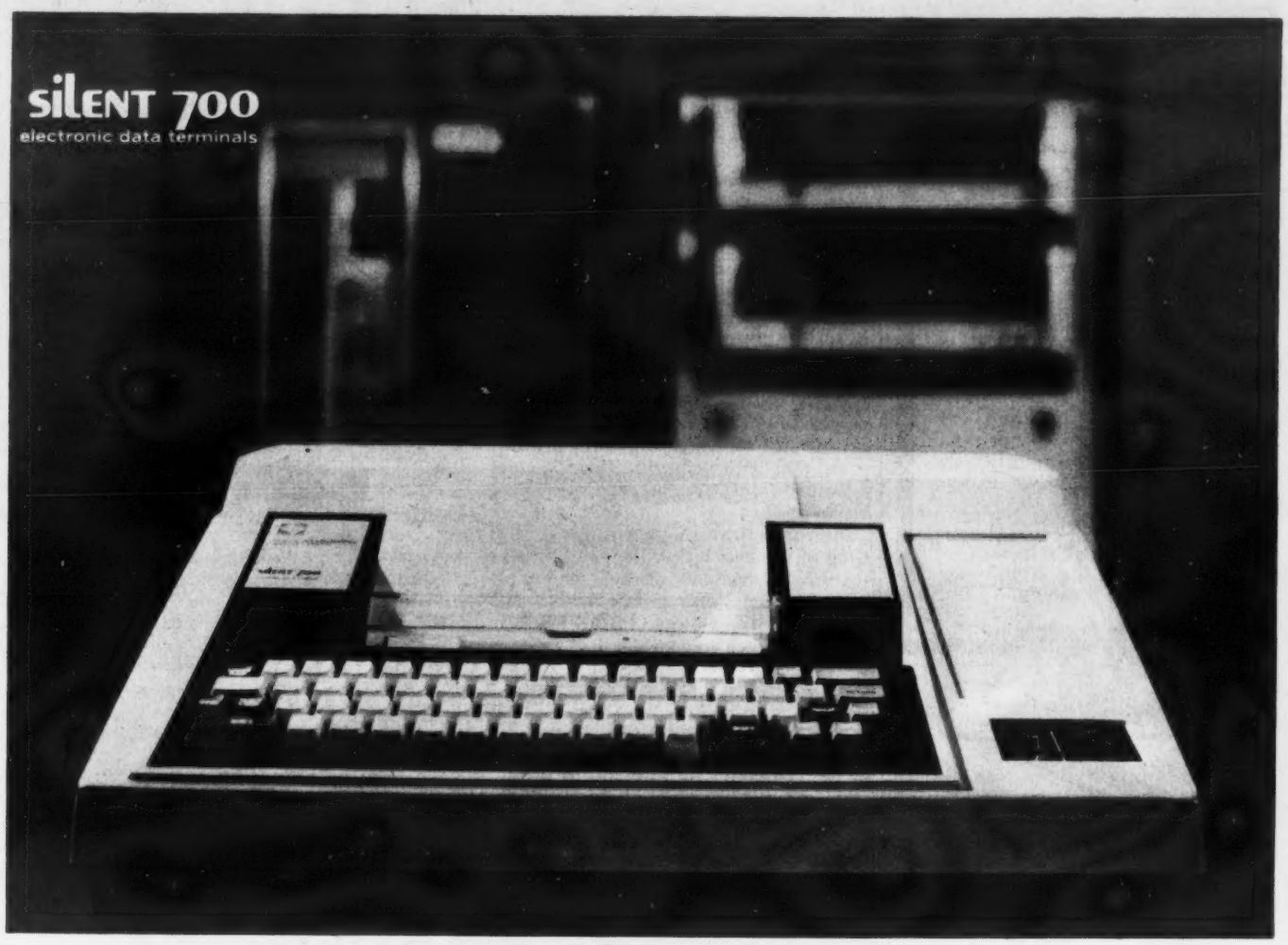
DENVER – The STR-Link portable tape cassette program loader from Electronic Processors, Inc. has a read/write capability of 110-, 150-, 300-, 600-, or 1,200 bit/sec through a 20 mA current loop or RS 232 interface.

Designed for on-site loading of programmable controllers, remote computers and terminals, the unit is priced at $995 from the firm at 1265 W. Dartmouth Ave., 80110.

Burroughs Has Cabinets

ROCHESTER, N.Y. – Modular cabinets are available in base or stacking units for storage of cartridge disk packs and 96-column cards from Burroughs Business Forms and Supplies Group. Disk modules provide vertical storage of disks and 96-column card modules provide storage for up to 30 trays with a total capacity of 72,000 cards.

Prices start at $125 for a disk cartridge module that stores up to 13 standard cartridges and $295 for a card module.



Now. A quiet, reliable, 30 characters-per-second I/O data terminal. Only $1500

*Silent 700** KSR data terminals cost-effectively enhance communications, process control, lab instrumentation and data processing systems.

They reduce the cost of downtime and repairs. A *Silent 700* KSR terminal will typically operate a year with only one or two service calls. They are backed by a nationwide force of TI service engineers and the field experience of thousands of *Silent 700* terminals operating worldwide.

They reduce costs with speeds up to three times that of conventional terminals.

And they feature quiet, non-impact electronic printing.

Silent 700 KSR terminals are available with a variety of options to meet your system requirements.

"Silent 700" ASR terminal. $2750.00

And – as your system requirements grow – KSR terminals are convertible to ASR models simply by adding the cassette module and its controller.

KSR lease rates are $75 per month for a 12-month lease, and only $55 per month for a 48-month lease... both include maintenance.

For information, contact the nearest office listed below or Texas Instruments Incorporated, P. O. Box 1444, Houston, Texas 77001. Or call (713) 494-5115, ext. 2124.

**Trademark of Texas Instruments Incorporated*

Arlington, Va. (703) 527-2800 • Atlanta, Ga. (404) 458-7791 • Boston, Mass. (617) 890-7400 • Chicago, Ill. (312) 671-0300 • Clark, N.J. (201) 574-9800 • Cleveland, Oh. (216) 464-1192 • Dallas, Tx. (214) 238-5318 • Dayton, Oh. (513) 253-6128 • Denver, Co. (303) 758-5536 • Detroit, Mich. (313) 353-0830 • Hamden, Conn. (203) 281-0074 • Houston, Tx. (713) 777-1623 • Huntsville, Ala. (205) 837-7510 • Indianapolis, Ind. (317) 248-8555 • Milwaukee, Wis. (414) 475-1690 • Minneapolis, Minn. (612) 835-5711 • New York, N.Y. (212) 541-9540 • Orange, Ca. (714) 547-9221 • Orlando, Fla. (305) 644-3535 • Philadelphia, Pa. (215) 643-6450 • Phoenix, Az. (602) 249-1313 • Rochester, N.Y. (716) 461-1800 • San Francisco, Ca. (408) 732-1840 • Seattle, Wash. (206) 455-1711 • St. Louis, Mo. (314) 993-4546 • Amstelveen, Holland 020-456256 • Bedford, England 58701 • Copenhagen, Denmark (01) 917400 • Frankfurt, Germany 0611/39 9061 • Manchester, England 33411 • Milano, Italy 6888051 • Montreal, Canada (514) 332-3552 • Paris, France (1) 630-2343 • Stockholm, Sweden 67 98 35 • Sydney, S. Australia 837-015 • Toronto, Canada (416) 889-7373

TEXAS INSTRUMENTS
INCORPORATED

Visit the TI Booth 501 at NCC

KOMAND: FOR THE IBM 370/145 OS OR VS USER WHO WANTS ADVANCED RESOURSE CONTROL NOW

Working from the standard SMF data base the DTR performs the essential cost and utilization reporting functions.

Installation of the DTR gives the new user the opportunity to have cost control and utilization measurement at lower cost – with high quality KOMAND components, system support by PACE, and easy, economical, upward compatibility to the total KOMAND Data Acquisition System under PACE's full credit policy.

KOMAND/DTR provides:

- Cost Distribution. Flexible job accounting with options for differential pricing of special users, computing systems, TSO jobs, special forms and priority scheduling. Other options provide assignment of costs for resources not measured by SMF.

-THE DATA REPORTER (DTR)-

- Resource Utilization – Reports computer resources utilized by jobs, summaries by organizational entities and computing systems, job usage of core and devices over time; program paging activity.
- Revenue Analysis – Reports revenue generated by computer resource categories, jobs and cost centers. Revenue simulations capability is provided by a flexible pricing methodology.

For more information, call or write:
PACE Applied Technology, Inc.
1117 North 19th Street
Arlington, Virginia 22209

PACE
(703) 527-4810

VALUABLE SPACE FOR RENT

Short- and long-term leases.

Fresh locations weekly. Or you can contract for the same location on a monthly or yearly basis.

Rates start at $44.80 per column inch. And can go as low as $25.20 per column inch with frequency discounts.

Contact Judy Milford at (617) 965-5800 to reserve your advertising space in a future issue of *Computerworld.*

COMPUTERWORLD
797 Washington Street
Newton, Mass. 02160
(617) 965-5800

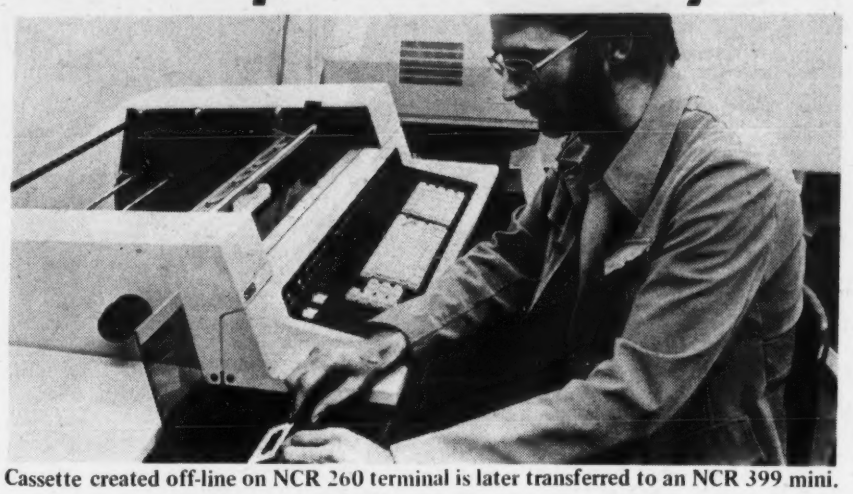
Slaughterer Beefs Up Sales Analyses

SELMA, Calif. – As a by-product of the weekly preparation of statements, management at Diamond Meat Co. used to get a sales breakdown on 150 products. Then the San Joaquin Valley beef slaughterer replaced its conventional ledger card accounting machine with a minicomputer-based business system.

Now a daily sales analysis for 150 product lines is produced showing quantities, weights, prices and dollar totals for each category, plus summary totals for the day's business as a whole.

In addition, office manager Ron Oaks said, the company is able to validate the weight and price of every line item. And because the new system permits invoices to be sent with deliveries, there is good reason to expect the company's cash flow to improve.

Diamond Meat slaughters about 400 head of cattle a day. A fleet of 22 trucks makes deliveries to markets and meat jobbers as far south as Los Angeles and north to Sacramento and San Francisco. With most customers buying twice a week, the company processes an average of 150 orders a day, Monday through Friday.



Cassette created off-line on NCR 260 terminal is later transferred to an NCR 399 mini.

The necessary paperwork is done on a 16K NCR 399 minicomputer and a free-standing printer rated at 125 line/min. Tape cassette input is prepared off-line on an NCR 260 terminal. The data input device also has a thermal printer which produces a proof copy for the operator.

Starting about 2 p.m. and continuing until the job is completed at 10 p.m., orders from the office and six outside salesmen are keyed in on the 260. Since the orders have been forwarded from the shipping department where they were sequenced for routing, load numbers and stop numbers have been assigned.

Other data encoded onto tape cartridges includes date, customer account number, name, ship-to instructions, quantity, product code, description and the price. After keyboarding, the orders are returned to shipping and the weight for each line item is recorded as it is loaded. Then the orders go back to data processing.

Before invoices are generated, the original tape cartridges – a separate one for each route – are validated for account number and product code on the 399. Billing addresses are extracted from memory at this time, and prices are checked against the figures stored there. Any price deviations are printed out on a journal in the 399 platen.

In response to the operator's direction, the computer requests 399 keyboard input of the weight for each line item. This is checked for an allowable plus or minus variation of 10% against the table in memory. Sometimes, Oaks explained, customers phone in additions to their orders; this step makes sure any line item increase is accounted for.

The computer makes all price extensions and triggers production of five-copy, carbonless paper invoices on the free-standing printer. Three copies are retained in the office and two go with the driver, one for the customer and one to be signed and returned.

At the same time the invoices are printed, a fresh tape on the second cartridge handling station of the 399 is encoded with the complete record of each order. The next morning, these cassettes are processed to derive the detailed sales report for management and to update the accounts receivable file. The

(Continued on Page 51)

The Small Systems User

SALES REPS·DEALERS
CAN YOU LEASE PACKS?

LEASEPAC CORP Will Pay You The HIGHEST Commissions In The Industry!

MODELS 1316 • 2316 • 3336-I • 3336-II

NOW YOU CAN MAKE MORE MONEY AND OFFER YOUR CUSTOMER...

- FULLY GUARANTEED NEW & RECERTIFIED DISC PACKS
- IMMEDIATE AND CONTINUING AVAILABILITY
- EXCELLENT PRICING
- LIBERAL CONVERSION TIME
- SALE AND/OR PURCHASE OPTION PLANS
- FLEXIBLE LEASE TERMS

WRITE OR CALL COLLECT
MR. STEVE FOLEY
LEASEPAC CORPORATION
23945 MERCANTILE ROAD
CLEVELAND, OHIO 44122
Phone: (216) 464-2850

I'm interested in learning more about your disc pack lease program for dealers.

Name
Firm
Title
Address
City State Zip
Phone No.

VOLUME KEY PUNCHING
(402) 346-0330

"JUST MINUTES AWAY"

AMERICANA KEY PUNCH
Redick Tower
Omaha, Nebraska 68102
and Ft. Worth, Texas

NCR COM gives you fiche completely cut and dried.

That means savings to you.

NCR's Microfiche Recorder/Processor is the first to give you fiche completely cut and dried. There's no chemical handling because all the film is processed right within the system. You just plug it in. There's no added expense for a darkroom, plumbing, additional processors or extensive training.

NCR software is another plus feature. With little or no change to up-and-running programs. You save on programming costs and eliminate delays. These software programs are compatible with most mainframes, too.

Service and support? NCR's worldwide network of over 18,000 service specialists, along with a complete line of microform supplies, is the best you can get.

COM is a good thing. And NCR makes it that much better. Get all the facts from your local NCR representative. Or write directly to COM Systems, NCR, Dayton, Ohio 45479.

NCR
Complete Computer Systems

Sick of late news?

A subscription's the prescription

order your own subscription

Please send me COMPUTERWORLD for 1 year.

☐ U.S. – $12 ☐ Charge My American Express Account:

☐ Canada – $13 ☐ Other foreign – $36

If charge, we must have cardholder's signature:

☐ Payment enclosed ☐ Bill me

First Initial		Middle Initial		Surname	
Your Title					May 8, 1974
Company Name					
Send to: Address					
City			State		Zip Code

Address shown is: ☐ Business ☐ Home

☐ Check here if you do not wish to receive promotional mail from Computerworld.

COMPUTERWORLD • Circulation Department • 797 Washington Street • Newton, Mass. 02160

PLEASE CIRCLE 1 NUMBER IN EACH CATEGORY

YOUR INDUSTRY

01 Mining/Construction/Oil & Refining
02 Manufacturing – Computer or data system hardware/peripherals/other associated mechanical devices
03 Manufacturing (other)
04 Utilities/Communications Systems/Transportation
05 Wholesale/Retail
06 Finance/Insurance/Real Estate
07 DP Service Bureaus/Software/Planning
08 Business Services (except DP)
09 Education/Medical/Legal
10 Federal, State and Local Government
12 Communications/Printing/Publishing
13 Other:

YOUR FUNCTION

01 Corporate Officer
02 Data Processing & Operational Management
03 Data Processing Professional Staff
04 Consultant
05 Lawyer/Accountant
06 Engineering-Management/Scientific/R&D
07 Sales/Marketing/Account Executive
08 Librarian/Educator/Student
09 Other: _____

COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

Energy Crisis Boon to Wholesale Grocer

LAWRENCE, Mass. – The energy crisis has actually helped some businesses and for some, the increased business has led to computerization.

Maroun Bros, a wholesale grocer which serves more than 300 "mom and pop" convenience stores with canned and boxed goods, frozen foods and dairy products, is a case in point.

Business has picked up now that many people drop into the local stores instead of driving further to larger supermarkets. And Maroun has had to install a small computer to keep up with its increased volume of business.

The company's growing clientele required an economical approach to records management. "We also needed to add inventory control and a comprehensive order catalogue. Basic/Four gave us these," said Charles Maroun, company president.

Maroun selected a Basic/Four Model 350, with a CPU, CRT terminal and printer. The system performs order entry invoicing, inventory control, accounts receivable, payroll and accounts payable.

"The Basic/Four inventory control procedures have virtually eliminated out-of-stock conditions in our 70,000 square foot warehouse," Maroun said.

Maroun is also able to provide its small retailers with basic business information to help them manage their businesses. Each customer's bill furnishes suggested retail prices and profit percentages.

The small business computer prepares a 125-page catalog twice a month. The catalog lists items by number, gives a description of the item, the number of items contained in a package, the cost and the suggested retail price.

Slaughterer Beefs Up Daily Sales Analyses

(Continued from Page 48)

latter tapes provide the open line-item input for the weekly statements.

"Previously, we inserted copies of the invoices for the week when we mailed the statements," Oaks said. "Since we have many customers who pay by invoice, sending them out with the orders will probably speed cash flow. We've only had the new system for two months, however, so it's too early to pinpoint this precisely."

The office manager said off-line preparation of input data on magnetic tape entailed an investment that was only one-third of what would have been required for punched cards. Moreover, since the tapes are read in at the rate of 750 char./sec, the process is faster than card input.

INSTALLED **MAPS** PROVEN

MANUFACTURING AND PRODUCTION SYSTEM
RELIABLE

- Engineering Data Control
- Inventory Control
- Requirements Planning
- Process Data Control
- Shop Floor Control
- Purchasing
- Forecasting
- Standard Cost
- Capacity Planning

** SPECIALISTS IN SERVING THE MANUFACTURING INDUSTRY **

MODULAR DESIGN
INTEGRATED DATA BASE
ECONOMICAL & EFFICIENT
COMMUNICATIONS ORIENTED

CUSTOM INSTALLATION
MODIFIED TO YOUR SPECIFICATION
PHASED INSTALLATION
EXPANDABLE
SUPPORTED

FOR ADDITIONAL INFORMATION CONTACT
RICHARD P. DALY

COMSERV

3050 METRO DRIVE / MINNEAPOLIS, MINN. 55420 / 612 854-2020

3 steps up to cut downtime.

Bell System engineers pioneered modern data communications in the mid-fifties. Our long experience means our data equipment has unmatched dependability and reliability. And our maintenance force has expertise unequaled anywhere.

Our local maintenance people promptly solve most of your data problems.

For those rare stumpers, they are backed by our Data Technical Support Plan (DATEC), a program that enables them to get help quickly from all levels of the Bell System.

A really difficult problem may even be referred to the engineers at Bell Laboratories and Western Electric who designed the equipment involved.

At AT&T and your Bell Company, we know that when your data communications operation is down, you need help in a hurry.

We hear you.

McNELL SECURITIES CORPORATION

Investment Bankers, Underwriters and Distributors of Securities

22 Thames Street
New York, N.Y. 10006
(212) 267-6400

CAPITAL FOR EMERGING AND MIDDLE-SIZED COMPANIES INVOLVED IN THE COMPUTER INDUSTRY

We feel that now is the time for emerging growth companies in the computer industry to establish long term financial strategy and consider raising capital, in the way we believe will help the company grow faster, more profitably.

We underwrite public offerings between one and five million and also arrange private financing.

To become a client, a company must have a profitable history and good growth potential.

McNELL SECURITIES CORPORATION

Contact Thomas R. Mc Nell (212) 267-6400

Wang Users 'Swap' Software Programs

TEWKSBURY, Mass. – Users of Wang equipment have a forum where they can exchange ideas and get helpful hints. The Wang user group, known as the Society for Wang Applications and Programs, or "Swap," is based on a sharing or swapping of software between users of Wang equipment, according to Jason R. Taylor, Swap executive director.

Societies/ User Groups

The main purpose of Swap, he said, is to make available the most powerful, extensive and useful multidisciplined Wang program library possible, by user-user swapping.

"Swap also provides direct user feedback to Wang Laboratories concerning both equipment and programs," Taylor said.

Membership in the user group is open to any owner or user of Wang equipment.

Two Types of Membership

There are two types of membership. An installation member is a user who is immediately concerned with the operation of a Wang system. An organization may appoint one installation member for each Wang system used. The membership fee is $15 a year and these members are entitled to vote on all Swap policies and on the election of officers.

The second type of membership is the individual member. This is for either someone employed at an installation owning Wang equipment, but who is not an installation member, or for an individual with a direct interest in Swap or Wang equipment, but who is not an employee of an installation owning Wang equipment. Individual membership is $5 a year.

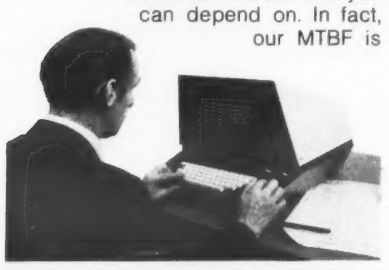
Several Special Interest Subgroups (SIS) have been formed to promote common interests. These include SISs in accounting, agriculture, automobile sales, income tax, electrical engineering, medicine and real estate, among others.

Communication among members is maintained through *Programmer,* the group's official newsletter and through an annual symposium, Taylor said.

Further information on Swap is available from 836 North St., 01876.

Before we deliver a Westinghouse terminal, its reliability has been confirmed by a rigorous, 7-day burn-in cycle. Each terminal is placed on continuous, operational test at 40°C (104°F) to screen out possible circuit defects and assure all systems meet their performance specifications.

The result is a terminal you can depend on. In fact, our MTBF is now over 4,500 hours. That spells reliability whether the application is a management information system, coordinated production control, batch entry system or engineering design and testing.



Besides reliability, the Westinghouse 1600 provides the user with exceptional flexibility thanks to an extensive range of features offered as standard in the base price. These include both synchronous and asynchronous operating modes, eleven switch-selectable data rates plus format mode and a full selection of edit functions. In addition, a low-cost option – station address for polling by computer – can yield significant cost reductions by line sharing.

You can be sure ... if it's Westinghouse.

The Westinghouse 1600 is manufactured by:
WESTINGHOUSE CANADA LIMITED
Box 510, Hamilton, Ontario
Tel. 416-528-8811 Telex 021-655

Represented in U.S.A. by:
WESTON MARKETING CORPORATION
2351 Shady Grove Road
Rockville, Maryland 20850
Tel. 301-948-8300 TWX 710-828-0481

ADVANCED TECHNIQUES
3848 E. Colorado Blvd.
Pasadena, California 91107
Tel. 213-681-1093

Represented in U.K. by:
THE EXCHANGE TELEGRAPH COMPANY LIMITED
Extel House, East Harding Street
London, England EC4P/4HB
Tel. 01-739-2041 Telex 27595

Westinghouse helps make it happen

See the new W1620 Time-Share Terminal at the N.C.C. in Chicago, Booth 941-3, McCormick Place, May 6 to 10.

Conference Examines Computer Graphics

CHICAGO – Computer-based printing management systems; computer-based text processing and composition; the fundamentals of mailing list computerization; and mailing list services and distribution system developments are the four concurrent programs of the 1974 Graphic Communications Computer Conference here, May 15-17.

Computer-based production planning and loading, data collection through optical mark reading and computer-based production analysis will be covered in the management program.

Case Studies

The text-processing and composition program will feature several case studies including data base design concepts, publishing by facsimile transmission, and OCR input and electronic composition for multilevel mathematics and other tasks.

The third program is a tutorial design for printing firms wishing to take advantage of the opportunities for customer service through computer-based mailing list management.

Distribution system developments and mailing list system case studies round out the fourth program.

Registration for the conference at the Hotel Ambassador is $110 for GCCA members, $165 for nonmembers.

Further details are available from Norman W. Scharpf, GCCA, 1730 N. Lynn St., Arlington, Va. 22209.

APL Users to Convene

ANAHEIM, Calif. – The Association for Computing Machinery will sponsor the Sixth International APL Users Conference, May 14-17, at the Sheraton Hotel here.

The conference will consist of several sessions, concentrating on enhancements, extensions, applications, programming techniques, instructional methods and the future of APL.

A display area is planned, featuring demonstrations of APL-oriented hardware, software and application packages.

Registration is $15 for students, $40 for professionals.

Further information is available from John R. Clark, Orange Coast College, Costa Mesa, Calif. 92626.

IEEE Catalog Available

LONG BEACH, Calif. – The IEEE Computer Society Publications Catalog is available free of charge from the Computer Society, Publications Office, 5855 Naples Plaza, Suite 301, 90803.

NCC Pact Needs Ratification Also

Afips Business: DPMA,IIA Membership

By Toni Wiseman
Of the CW Staff

MONTVALE, N.J. – Two hot items on the business agenda for the American Federation of Information Processing Societies (Afips) executive board meeting this week are the possible memberships of the Institute of Internal Auditors (IIA) and the Data Processing Management Association (DPMA), according to George Glaser, Afips president.

Part of admitting DPMA to Afips will be a revised NCC agreement, he said, that will bring DPMA into the sponsorship of the National Computer Conferences on a basis fully equivalent to that of ACM and IEEE/CS.

The board of directors will also be asked to ratify that new agreement and simultaneously the ACM Council and the governing board of the Computer Society and that of the Soceity for Computer Simulation will also be asked to ratify the agreement, on disbursement of profits from the NCCs.

DPMA's application for membership, Glaser noted, is still subject to ratification by its international board which will meet in late June. "But again," he said, "we are most hopeful that they will ratify it."

"Two votes are needed to admit a new member to Afips," Glaser said, "so we will vote at this board meeting on Saturday, May 11 and again at the board meeting probably in November."

In other new business, a new Afips committee has offered the technical assistance of Afips volunteers to the Federal Reserve Board. This Special Committee on Electronic Funds Transfer is chaired by Dr. Bernie Galler of the University of Michigan, Ann Arbor.

The Federal Reserve Board, Glaser said, is considering modification to Regulation J, which concerns the transfer of funds among banks, in view of possible large-scale electronic funds transfers.

"Afips will not campaign for or against any particular piece of legislation," Glaser stated, "but we will indeed make available to the Federal Reserve Board the best technical talent we can muster to aid them in their deliberations."

Two other items on the agenda are the second USA/Japan Conference scheduled for Tokyo in August 1975, and the possible establishment of a Washington, D.C., information office.

The purpose of this satellite office, he said, is to collect information on the Washington scene on behalf of Afips constituent societies, and in turn to provide information to governmental units.

"Afips is financially healthy, based on a successful meeting in New York last year," Glaser said, "and we have every reason to believe that the Chicago meeting will also be successful."

"We're paying special attention to ways in which we can be responsive to the needs of constituent societies and have strengthened the channels of communication between us and them," he added. "My only measure of whether that is working or not is the attitude of the board of directors. And I believe we have a very good board of directors and one that's working well together."

Status Report: Societies

DPMA Keeping Active While Awaiting Word

PARK RIDGE, Ill. – While anxiously awaiting the outcome of the formal balloting for its admission to the American Federation of Information Processing Societies (Afips), the Data Processing Management Association (DPMA) is not sitting idle.

Afips membership has been approved by the DPMA Executive Council and is being recommended for approval by the International Board of Directors, said Donn Sanford, executive director.

"Just reading the sentiment in the field as I travel, I'd say the chances are better than even that the vote will be affirmative and that we will join Afips," Sanford said.

Early in April, DPMA started a series of advanced instruction in management (AIM) seminars. These are being held in 13 cities, sponsored by 11 chapters.

"This is the first time DPMA International has been in the so-called seminar business in many years," Sanford said.

This year also saw publication of the first in a manager reference series on specialized topics of interest to DP management. This first one was on understanding computer contracts.

DPMA also has a major book in the works on data processing management and a second on systems for nonsystems people.

"Membership is probably the dark spot on the overall picture," Sanford confided. "We're down probably a thousand members from this time a year ago."

On the more positive side, Sanford said, the association is going to finish the year in the black.

ACM Sees Brighter Future

BUFFALO, N.Y. – "ACM is about to start on a period of fairly considerable growth," President Anthony Ralston predicted.

"For the first time in some years our financial picture is good and we have resources to do things which we have not been able to do in some time," he said.

In particular, he said, he expects some considerable changes in the ACM publication effort over the next couple of months or year, involving more of a drive to orient the publications to the needs of the society's members and expand the publication effort in general.

"We are probably going to establish a small European secretariat over the next six months or so, most likely in Geneva," Ralston said, "for the purpose of better serving our members in Europe."

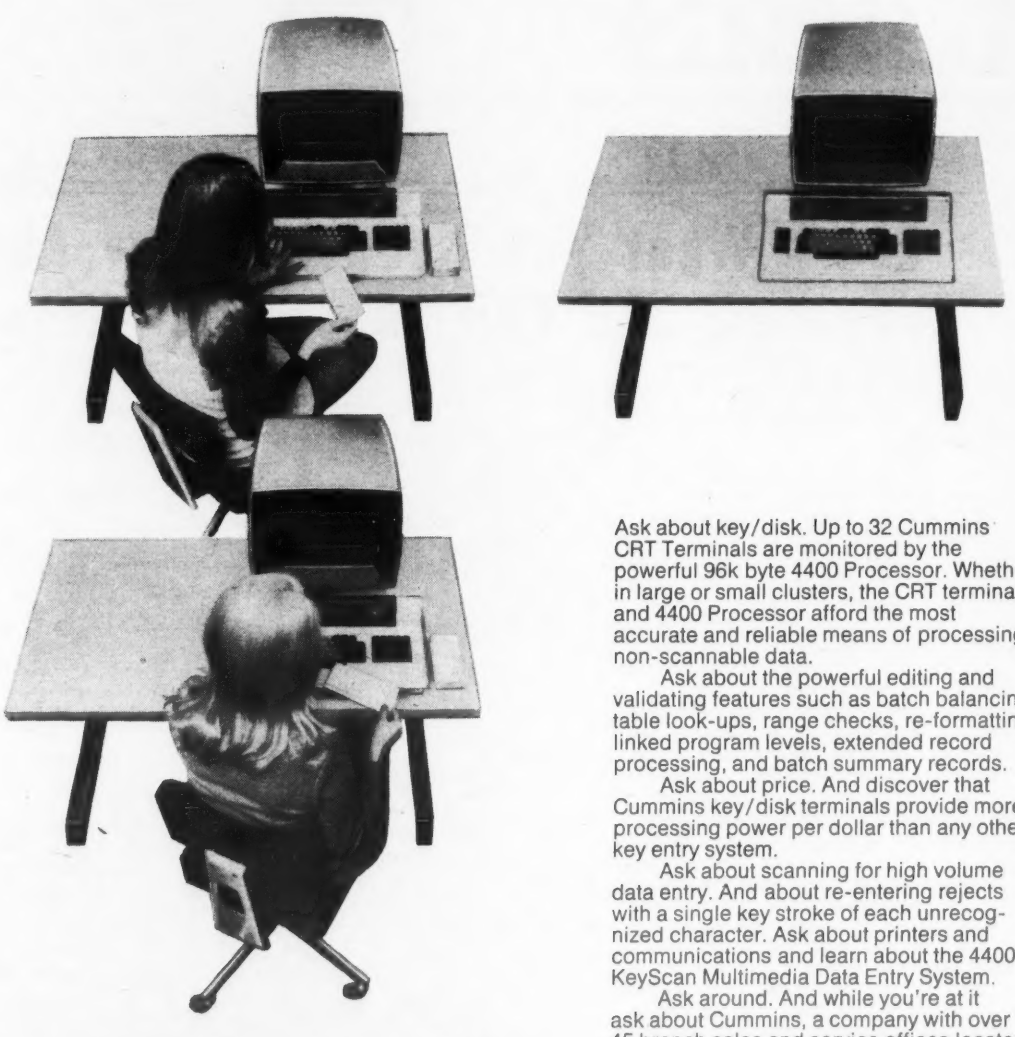
ACM has completed joint membership agreements with a number of societies in the past year, he said. The most notable is with the IEEE Computer Society, but four or five others have been concluded with organizations around the world.

"ACM is more and more involved with all sorts of outside activities," Ralston commented, "including, for instance, our involvement with the ICCP."

Ralston also mentioned the establishment of a new Special Interest Committee, Sigmini, in the area of minicomputers.

In the last year ACM established a second annual meeting, with sponsorship of the Computer Science Conference.

When you consider key/disk... ask about the Cummins KeyScan™ Data Entry System.



4400

KeyScan Multimedia Data Entry System

Ask about key/disk. Up to 32 Cummins CRT Terminals are monitored by the powerful 96k byte 4400 Processor. Whether in large or small clusters, the CRT terminals and 4400 Processor afford the most accurate and reliable means of processing non-scannable data.

Ask about the powerful editing and validating features such as batch balancing, table look-ups, range checks, re-formatting, linked program levels, extended record processing, and batch summary records.

Ask about price. And discover that Cummins key/disk terminals provide more processing power per dollar than any other key entry system.

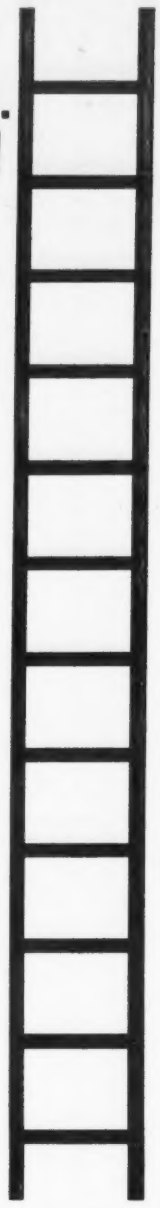
Ask about scanning for high volume data entry. And about re-entering rejects with a single key stroke of each unrecognized character. Ask about printers and communications and learn about the 4400 KeyScan Multimedia Data Entry System.

Ask around. And while you're at it ask about Cummins, a company with over 45 branch sales and service offices located across the country. Send for the 4400 KeyScan System brochure. Write: 830 Waukegan Rd., Glenview, IL 60025. Or ask the operator to dial 312/724-8000 and make an appointment to visit our demonstration facilities.

Ask about the KeyScan Data Entry System. Then ask about other systems and you decide which is best.

CUMMINS
CUMMINS-ALLISON CORP.

IF THINGS ARE A LITTLE SLOW ON YOUR LADDER... GRAB ONE OF OUR RUNGS!



NCR's new Accounting Computer Division in Wichita has immediate openings for seasoned Systems Software Programmers. Genuine ground-floor opportunities for those who are tired of the status quo. Advancement opportunities for professionals who want personal growth, technical development, responsibility and diversity.

SYSTEMS SOFTWARE PROGRAMMERS

• FIRMWARE DEVELOPMENT • MINICOMPUTER OPERATING SYSTEMS • COMMUNICATIONS • FILE MANAGEMENT • ASSEMBLERS • COMPILERS

We presently have openings for experienced Systems Software Programmers. Opportunities exist in the design, implementation and support of minicomputer operating systems, communications, file management, assemblers and compilers. Senior positions in processor design with an emphasis on virtual machines and operating systems for business systems.

INTERVIEWING IN CHICAGO MAY 6 THRU 10

If qualified and interested in any of the above opportunities call Mr. Mike Crawford, Monday thru Friday, May 6th thru 10th at (312) 922-7982.

If an interview is not convenient at this time please forward your resume to Mr. Don Wilde, Professional Placement, P. O. Box 1297CN, Wichita, Kansas 67201.

NCR

ACCOUNTING COMPUTER DIVISION
WICHITA, KANSAS 67201
An Equal Opportunity Employer

Binet System Supplies Visitors With Bicentennial Information

WASHINGTON, D.C. – With over two billion people estimated to partake in America's 200th anniversary celebration in 1976, the American Revolution Bicentennial Administration (Arba) has its hands full providing activity and event information to all interested planners throughout the country.

To carry out this service efficiently, Arba has set up a computerized, bicentennial information network (Binet) for the gathering and dispersal of celebration data.

Since its inauguration last summer, Binet has cataloged over 1,300 on-going projects related to the celebration in all 50 states, and in U.S. commonwealths and territories, according to network director E.K. Zimmerman.

Because the information service is on-line, he said, the requirements to hook up are quite simple.

"All that is required," Zimmerman explained, "is a telephone and a computer terminal. The terminal can be rented for $50/mo to $175/mo depending on whether the user wants a basic teletype or a CRT display with an automatic printer that operates at up to 30 char./sec." In addition, the total cost for Binet computer time ranges from $20 to $50 per hour, depending on usage.

"But," he emphasized, "the Binet information itself is for free."

Paul Brewster, Binet DP manager, explained that his organization catalogs information on bicentennial activities in a master filing system maintained by a Univac 1108.

"Its operation is handled by Computer Sciences Corp., and a portion of the programming and basic operating system comes from the General Services Administration. We're using their data management language (DML) for the software, but we're doing most of the writing."

Binet is part of Infonet, CSC's teleprocessing service, which has Binet access points within 600 miles of any part of the continental U.S. Special arrangements are being made to provide access points for Hawaii and the U.S. territories.

States Next Goal

Computer terminals have already been installed in Arba regional offices throughout the country, and the goal for the rest of 1974 is to set up terminals in participating state commissions. Brewster said, however, that private organizations planning to use network information will have to install their own terminals.

"Private organizations that want to get Binet service should apply to CSC, based in Los Angeles, for the teleprocessing service. Simultaneously, they should apply to Arba for the network service and data base access." Necessary information about terminals will be supplied at that time, he added.

Brewster foresees travel agencies, hotels and restaurants as typical private users.

Arba has been given the responsibility by Congress for preparing a master calendar of local, state, national and international events of significance during the bicentennial period.

Univac Signs Up

BLUE BELL, Pa. – Sperry Univac has become one of the first industrial companies to go on-line to the American Revolution Bicentennial Administration's Binet system.

A Sperry Univac DCT-500 data communications terminal with an output printer has been installed at the World Headquarters building here to provide management and visitors with information on the bicentennial activities.

(Advertisement) (Advertisement)

Learn What You Need to Know About Contracting for Computers and EDP Support Services-In One Hard Lesson

A two-and-a-half-day seminar that can help you protect your EDP investment – and your system.

The response to our first ad on this seminar was excellent, and we've decided to go ahead with three seminars in the first part of 1974. Conducted by Roy N. Freed, the well-known expert in computer-related law, this unique seminar can give you the information you need to get good, effective contracts from the vendors that supply your EDP installation. And in an industry that's famous for its "promise them anything" attitude, this information can be invaluable. It can save you money. It can save you time. And, most important of all, it can help you protect your installation from disruptive discontinuities.

Here are some of the subjects covered in the seminar:

- The lease or purchase of computer systems.
- The lease or purchase of separate hardware or software.
- The purchase of time-sharing, data processing services and consultation.
- The use of facilities management.

And here are some of the things you'll learn:

- How to recognize opportunities to negotiate.
- How to establish goals and state conditions – before it's too late.
- How to place yourself in a strong bargaining position.
- How to insure on-time delivery of exactly what you've bargained for.
- How to reach an agreement that protects the security of confidential data.
- How to set reasonable performance standards for warranties.
- How to provide tax savings through proper wording of contracts.

Free Resource Notebook

You'll also receive a valuable reference notebook which will back up the information you'll receive at this meeting. *The notebook will include sample vendor contract forms.*

Roy N. Freed, a leader in this field.

Roy Freed has specialized in computer-related legal matters for many years. He has served as inside counsel for a major manufacturer of digital computers, and is currently engaged in private practice with a prominent Boston law firm.

He has authored many articles on the various legal aspects of computers – including "Computer Frauds – A Management Trap" *(Business Horizons)* and a book entitled "Computers and Law – A Reference Work." Mr. Freed will personally conduct the entire seminar.

Should you attend this seminar?

If your're involved in the purchase of EDP equipment or services, the answer is a resounding "yes." Whether you're a corporate counsel, contract administrator, DP manager, consultant or officer of a using firm, this seminar will pay for itself many times over. You just have to read the pages of *Computerworld* to realize how frequent supplier problems are – and how costly and disruptive they can be. This seminar can help you get what you want when you want it. It will help your company, your industry and you!

Times, places and cost

There is still one more seminar scheduled this spring.

May 22-24–St. Francis San Francisco

Total cost for the entire seminar, including the complete resource notebook, continental breakfasts, lunches and coffee breaks, is $295.00. Hotel rooms, if required, are not included.

Note: Enrollment must be strictly limited, and our other seminars were sold out. So don't wait until it's too late to enroll.

Contracting for Computers and EDP Support Services

THE EDP SEMINAR SERIES

Sponsored by COMPUTERWORLD

To: Walter Boyd, Executive Vice-President
Computerworld, 797 Washington St., Newton, Mass. 02160

☐ Reserve place(s) at the seminar checked and send a copy of your descriptive brochure.
☐ Check enclosed ($295/per person) ☐ Purchase order enclosed
☐ Bill me (I understand that my registration cannot be confirmed until you have received my check or purchase order.)
☐ I'd like to attend the seminar I have checked, but cannot make a reservation at this time. Please send me your brochure. I understand that enrollment is limited.
Check City:
☐ Chicago Mar. 13 – 15 ☐ San Francisco May 22 – 24

Name _____

Title _____ Company _____

Address _____

City _____ State _____ Zip _____

Phone _____

Time-Sharing Pioneers Gather For 10th Anniversary Celebration

CHICAGO – Armed with the belief that learning to use computers would become as necessary for students as learning the alphabet, two Dartmouth College professors set about to bring computing power to as many students as possible.

Just 10 years ago, Dr. Thomas Kurtz and John Kemeny inaugurated the Dartmouth Time-Sharing System (DTSS), and this week's National Computer Conference here will celebrate the anniversary in a special three-part session.

Professors Kemeny and Kurtz strongly believed that computers could be used by students and used well by many if the equipment were available.

This belief was based on the fact that when they bought a small LGP 30 in 1959 for their math students, the students were programming better than the pros.

Something for Everyone

Bolstering their philosophy with a grant from the National Science Foundation, Kemeny and Kurtz pursued their ultimate goal – computing for the entire population of Dartmouth College: a system that would be suitable for use by students, administrators and faculty.

The heart of the early time-sharing system was a GE-265. The system was upgraded to a GE-635 in 1967, when the demand for DTSS outgrew the capability of the GE-265.

In order to make the system truly available for the diversity of "users" on campus, Kemeny and Kurtz developed a language which was easy to learn and easy to use – Basic.

The two professors and a staff of student assistants worked assiduously, sometimes as much as 50 hours a week, in addition to carrying a full academic load in the early days of developing the system.

At 4 a.m. on May 1, 1964, DTSS solved its first problem. And it wasn't long after that other colleges and secondary schools all over New England tied into their system, the first education network.

The special NCC session on May 8 will feature Dartmouth President Kemeny, and Kurtz, director of the Kiewit Computation Center at Dartmouth. Joining them as copanelists are those student assistants who contributed significantly to the project.

The first portion of the special session, a panel entitled "The Users Speak," will discuss several important ways in which an integrated information processing system is used in an educational environment.

The second panel, "Behind the Scenes," will emphasize the solutions and techniques employed in DTSS relating to reliability, security and performance measurement and evaluation.

Kemeny and Kurtz will cochair the third panel, "Reminiscences of Its Genesis," and look back on some of the events which accompanied the birth of DTSS, such as finding that their system emitted the same frequency on which the local fire department operated forcing them to shut down every time there was a fire.

In the Old Days...

Dr. Thomas Kurtz and student assistant Mike Busch (above) survey their early work on the Dartmouth Time-Sharing System in the old computer room at College Hall. Original student time-sharing users (right) are among the invited panelists at the Dartmouth celebration taking place this week at NCC.

City Has Time to Sell To Pay For 370/135

CW West Coast Bureau

GLENDALE, Calif. – To help defray costs of the purchase of an IBM 370/135, the city is offering time to private businesses, and so far has one customer.

The effort is strictly soft-sell, since the city council resolution authorizing the sale of computer time specified that the city must not compete with local service bureaus.

"We haven't been pushing hard," said Robert R. Jorgensen, EDP director, who said the city has a marketing agreement with Stat-Tab.

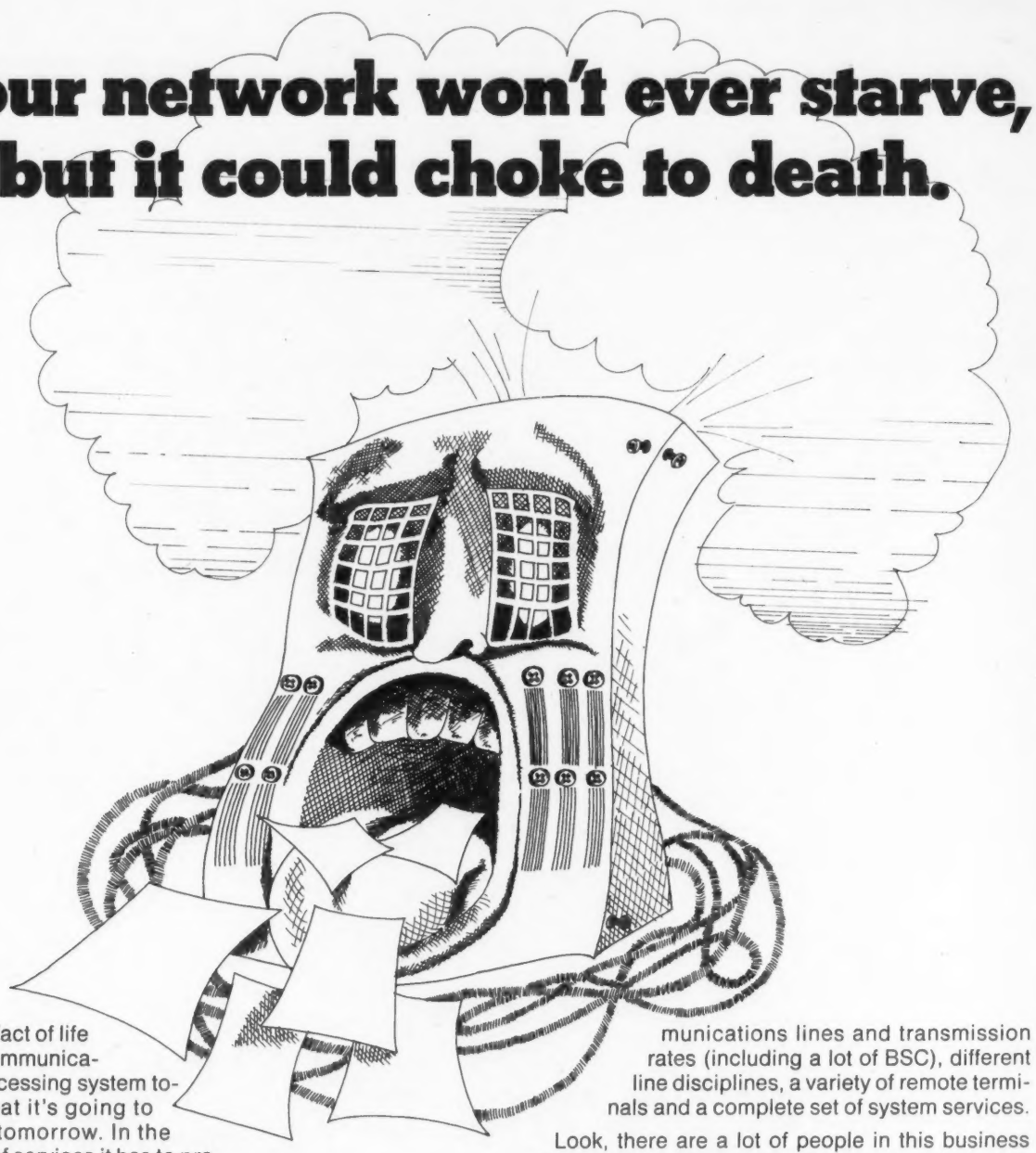
The city uses the 135, which it has had for a year-and-a-half, primarily for utility billing, city accounting functions and an on-line police system.

The city's first customer is an insurance company, which is using the 370 to prepare for the acquisition of its own 135. The time offered is from 10 p.m. to 6 a.m. daily and every weekend.

The city uses the computer fully during the day, Jorgensen said.

'Ah Yes, We're Expanding Rapidly'

Your network won't ever starve, but it could choke to death.



The first fact of life in any communications processing system today is that it's going to change tomorrow. In the number of services it has to provide, and in the size and complexity of the communications network it supports.

If you don't start with a configuration that suits the network now and in the future, you'll end up with a major source of trouble trying to join other sources of trouble.

With our CC-70 you get hardware that suits the network and software that suits the hardware. And both are modular enough to grow compatibly with a minimum of costs and no aggravation.

That means you can begin with IBM 270X emulation and end up with a turnkey, five processor message switching system without suffering a nervous breakdown. Or any other breakdown, for that matter.

The CC-70 is flexible enough to handle a mix of communications lines and transmission rates (including a lot of BSC), different line disciplines, a variety of remote terminals and a complete set of system services.

Look, there are a lot of people in this business who start things they can't finish. Often they start things they can't even begin. You don't need that. For facts, not fancy, give us a call. Before things get out of control.

Computer Communications, Inc.

2610 Columbia Street, Torrance, CA 90503
213/320-9101

Up and running...at Eastern Airlines, the State of Tennessee, Commonwealth Edison, EXXON, American National Insurance, University Computing Company, Aluminum Company of Canada, Mobil Pipeline Company, Union Carbide, Canada Systems Group, Shell Oil, the Universities of Nebraska and Waterloo, three major stock exchanges and elsewhere.

But Training, Retaining a Bone of Contention

Everyone Agrees: People Key to Successful DP Shop

By Nancy French
Of the CW Staff

BOSTON – Personnel training and career development are hot topics in the DP industry, a Caravan session here recently emphasized.

While Frank Malatesta, Paul Ladd and Jeffrey Langmead all agreed on the importance of "people" in a DP shop, they sharply disagreed on the best way to train and retain those people.

Ladd, representing the Worcester County National Bank, maintained the best way to build "a top-rate team" was to evaluate the strengths and weaknesses of existing staff members, and recruit to fill the gaps. "Then hold onto your people," he suggested, "by offering good in-house training opportunities and a chance for promotion and good salary increases within the company.

"But before you can even begin recruiting," Ladd said, "a smart company determines if its salary structure is competitive."

'No Surprises'

Malatesta, a personnel administrator for Polaroid Corp., emphasized that the key to happy employees is making sure they know "where they stand" with the company. Also, they must have a clearcut idea of their personal goals and how these mesh with those of the company – with "no surprises."

Spotlight on Personnel

Disagreements among the panelists seemed more a matter of degree than ideology.

Malatesta's recommendation for annual written evaluations and periodic discussions of performance was countered by Langmead of Blue Cross/Blue Shield, who agreed with the "no surprises" approach, but who insisted that an employee must know "day by day what you think of his work."

Once a year is not enough, he said.

Personal Evaluation

Ladd, too, supported a less formal but more frequent and personal style of performance evaluation.

"I tell a man every day what I think of his work in one way or another," Ladd said.

Langmead believes Ladd's principle of hiring people at entry level, training them in-house and giving small periodic salary increases, is ineffective. He said, "I don't want to train people in-house. If you do, you hire a trainee at $7,000, train him for three years when he'll be worth a salary of $15,000, and then lose him to another company when you can only pay him $10,000 because of companywide salary rates.

"I'd rather hire a superstar, pay him $15,000 if he's worth it, regardless of what the rest of my staff is getting paid, because I believe in paying people what they're worth.

"If an old employee complains," Langmead continued, "give him a raise, if he's worth it, but if he's not, tell him so and let him go elsewhere."

"It's a wonder your shop hasn't fallen apart," Malatesta commented.

Odd Man In

Moderator Dr. H.R.J. Grosch pointed out that a stratified system as described by Malatesta would serve about 90% of all employees, but there ought to be an alternate route for those who don't fit into such a mold – the point being that many of those "odd balls" are very creative, valuable people.

"There ought to be one trap door for superstars and another for 'substars,'" he added.

On the issue of career patterns one participant suggested it was wrong for all operators to aspire to be programmers because the money was better.

Another participant said a means of avoiding that situation would be to pay better salaries for positions concerned with center management – such as shift leaders and schedulers. This would encourage people to stay in jobs where they perform best.

The session closed with a discussion of whether industry was becoming more "people-conscious."

Langmead stated that programmers needed no special treatment. "Rather than worrying about any tendency to treat programmers as clerks, maybe we should learn to treat clerks better," he said.

English Dropouts Get Help Choosing Career

Special to Computerworld

CHESHIRE, England – Working in conjunction with the Cheshire County Council, IBM UK has put into operation a computerized careers guidance system to help school dropouts decide what they will do with their lives.

Currently being evaluated at two schools, the system is offering help to 800 students. Based on the "developmental theories of career choice" developed in the U.S., the project is geared to the premise that choice of career is concerned with the answer to the question, "What sort of a person do I want to become?" as well as to earning a living.

Personal Profiles

IBM 3270 CRT terminals at the schools are linked by Post Office telephone line to an IBM 370/145 computer. Students have access to a data base of 300 careers and are shown details which help them develop profiles of themselves in terms of likes and dislikes about life in general.

Printouts can be obtained of any aspect of a career possibility allowing for amendments suited to personal ideas. The data base is based on a system of classification developed at Leeds University and titled "Spedcop."

There are eight career analyses covering surroundings, prospects, entry and training, effect on individual lives, type of work, conditions, organization characteristics and people relationships.

Interest fields are also identified, and careers are analyzed in terms of six areas of responsibility – from the professional to the unskilled worker. The system can hold eight profiles for each student.

New Vistar/XL

Infoton has something very special to show you—

A New Micro-Programmable Display Terminal

Infoton

Second Ave., Burlington, Mass. 01803
(617) 272-6660

A wholly owned subsidiary of Optical Scanning Corp.

If you're not attending the show, contact us for full information.

NSA Overcomes Reluctance for In-House Training

WASHINGTON, D.C. – Firms that hire liberal arts college graduates for positions as programmers and systems analysts after an on-the-job training program generally find a large obstacle in the reluctance of supervisors to free their trainees for classes.

But by tying promotion to the professionalization program, the National Security Agency has ensured that its work force is given the opportunity for the training it needs to keep up-to-date, according to Richard Wille, executive of the computer systems career panel for NSA.

Spotlight on Personnel

"Many supervisors are reluctant to allow an employee to take time off to increase his knowledge unless it is of immediate use on his current job," he explained.

'Reluctance Overcome'

"This program has helped overcome this reluctance and provided the incentive to the employee to seek additional training in his career field."

The NSA has a three-year intern program for liberal arts graduates with a minimum gradepoint average of 2.5 and also offers its "on-board" personnel an opportunity to enter the intern program.

Intern applicants are tested for programming aptitude and for probability of success in the overall computer field and are required to give some indication that they have an aptitude in some other agency career field, Wille said.

Each intern has an adviser, and the program is tailored to his needs and interests.

During the three years, an intern must complete a number of requirements, most of which are designed to be performed as part of his work assignments.

He has three work assignments exposing him to at least three different aspects of the computer field, and must write at least one major program in each of four languages.

Course Load

The intern takes a minimum of three college-level math or computer science courses and takes, or has taken, a basic college math course as well as probability and statistics.

He must also write an acceptable 2,000-word technical paper and pass the Computer Systems Professional Qualification Exam, Wille said.

"On-board" personnel, such as in operations, may also complete the professionalization course, but it normally takes them five to eight years.

These people need to accumulate 1,000 points, write the paper, at least one major program and pass the test. Points are given for college education, training in the NSA school or other technical schools, work experience in computers and related fields at NSA and professional achievements, he explained.

Paraprofessional Program

Last year the NSA started a paraprofessional program for operators, with on-the-job training and schooling required. The program includes seven courses, five with two different kinds of computers.

The agency is planning a production control program, and is talking about instituting a program for a higher level of professional certification to keep professionals involved in the ongoing training programs, he added.

Mobile Medical Unit Performs Checkups

ROCHESTER, Minn. – Computerized physical examinations were recently administered here by the Health Testing Services, Inc. of Minneapolis.

Using what is referred to as a Computa-Lab Mobile Health Testing Center, the HTS medical technicians oversaw automatic blood pressure tests, heart ECGs, urinalyses, X-ray analyses and other routine health checkup procedures that took under an hour per patient. The mobile unit's computer carried out and evaluated the results of all tests after the technicians readied patients for the checkup.

The service, which was experimentally tried out on members of a local engineering union, does not require the presence of a physician.

For Lease
Teletype* Model 33ASR with tape perforator and reader– $55 per month.
Model 33 KSR send/receive– $40 per month.

Available in any quantity for immediate delivery– includes nationwide maintenance service.

Call or write:
RCA Service Company
A Division of RCA
Technical Services
Bldg. 204-2, Camden, N.J. 08101
Phone (609) 779-4129
*Registered trademark of Teletype Corp.

RCA

Want to pamper your printer with a banquet sized supply of continuous forms? Or whet its appetite with 250—fast?

Either way you can depend on Curtis 1000 continuous forms to run smoothly and cause no trouble. Quality? It has been our hallmark for over ninety years. Service? We supply you, economically, direct from regional facilities.

Heard about our Envo-Mailer continuous self-mailers? These form-and-envelope combinations eliminate collating, inserting, sealing, and metering. They are available in almost any combination of envelopes, forms, and special inserts. And we can give you immediate delivery on blank Envo-Mailers.

Ask your local Curtis One Thousander for samples. Or write to Jack Holloman, Vice President-Marketing, Curtis 1000 (Reference CW-CF), 1000 Curtis Drive, Smyrna, Georgia 30080.

Curtis 1000 supplies continuous forms and hundreds of other products through over four hundred full-time, local-area, systems-oriented product specialists.

Curtis 1000
Business Forms, Envelopes, Supplies

Curtis 1000 is a member of the American Business Products family of companies and is the principal national marketing arm of ABP.

As Overtime Work Grows

UK Computer Operators Seen Resisting 'Shift' Rules

By Joseph Hanlon
Special to Computerworld

RICHMOND, Surrey, England – Computer staffs here are doing more shift work and overtime as firms try to squeeze more performance out of expensive and rapidly depreciating equipment.

Unlike blue-collar workers, however, the white collar computer operators do not have a long tradition of shift work and they don't like the extra work.

These conclusions from a new study, "Shift Working and Overtime Practices," are based on a survey of 152 medium and large computer users in the UK.

Compared with a similar survey conducted four years ago, the report noted that "shift working has continued to increase and the practice is now almost universal in medium to large commercial installations." All but one of the respondents operated a shift system.

But it is not just that more installations work more than one shift. "The trend is for more staff to become involved in increasingly intensive shift patterns, most usually caused by increases in workload."

The percentage of installations working 24 hours a day, seven days a week, doubled in four years to 8%. But they are the larger installations, with 17% of the staff of those surveyed. Five-day-a-week, 24-hour-a-day coverage is provided at an additional 69% of the installations, with 73% of professional (programming and operating) staff.

"... In many cases shift working is not accepted as the norm, but rather as an obligatory apprenticeship prior to progression into 'more normal' office work ..."

In general, the operating staff, not the programmers and managers, work shifts. A few keypunchers, tape librarians and data control staff also work shifts.

Five-day-a-week shops tend to work on a weekly or fortnightly shift rotation; seven-day-a-week installations all have a more complicated rotation with only a few days on each shift.

The main compensation for shift work is extra money – 25% extra is common, either in the form of extra to everybody or a 25% bonus for the evening shift and 50% for the night shift. Indeed, one problem noted by the survey is that some shiftworkers earn so much extra that they have to take a salary cut if they are promoted to a nonshift job.

Shift Working Unpopular

Despite the extra money, shift workers are unhappy. When employers were asked about problems, "the most frequently cited topic was that of recruitment and retention, emphasis being placed particularly on the difficulty of persuading staff to remain on shifts after a period of two or three years." The biggest problems were in the seven-day shops.

"This demonstrates clearly the distinction between shift working in data processing and more traditional blue-collar environments where liability to shift working has become institutionalized," the survey noted.

In blue-collar environments "shift working is built into the 'job expectation' and in many cases the organization of the whole community has been modified accordingly. However, in many organizations the computer operating group is the only 'office staff' employed on shifts."

The survey pointed out that "in many cases shift working is not accepted as the norm, but rather as an obligatory apprenticeship prior to progression into 'more normal' office work in the systems and programming functions, which are widely regarded as the only possible long-term career opportunities."

Spotlight on Personnel

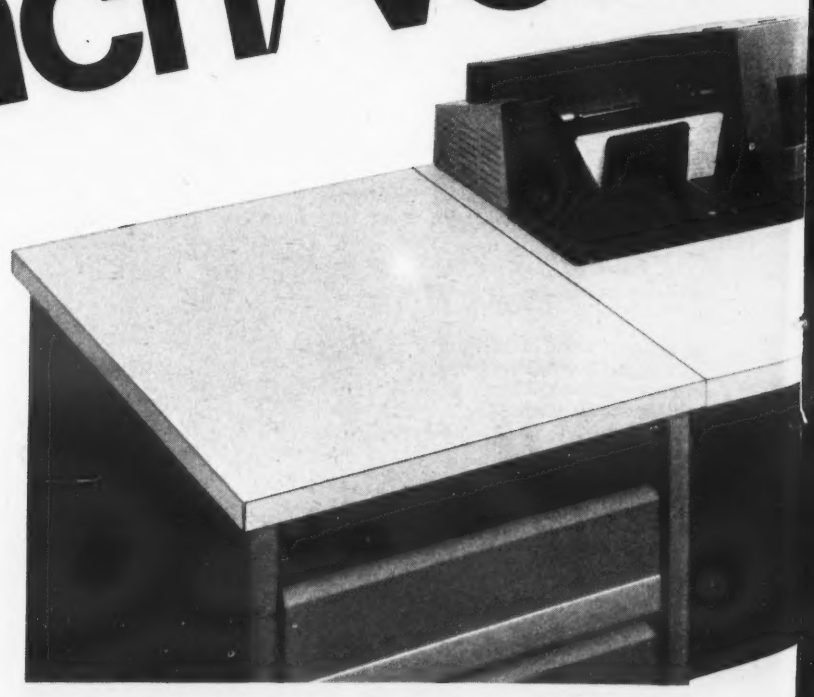
Only one-sixth of the shift and overtime working agreements were set up in consultation with trade unions and staff associations – the rest were determined by management. But the report found that "unions such as the National Union of Bank Employees are now setting up specialist committees to study the specific problems of white-collar shift and overtime practice, and are likely to include these subjects in further negotiations."

In general, higher salary is the only benefit that shift workers get. Because there are often so few computer staff at night, little is done about food and transportation, even in areas where public transportation is commonly used and not available late at night. For food, the most common provision for computer staffs is some sort of do-it-yourself-facility. But others offer prepacked sandwiches or

(Continued on Page 59)

A powerful, productive
Key-to-card
Data entry
System.

Tab
Punch/Verifi



Programming 'Social' as Well as Individual Activity

By Molly Upton
Of the CW Staff

BINGHAMTON, N.Y. – "One of the main reasons for lack of success in teaching computer programming is the failure to recognize the diversity of the task," according to Gerald M. Weinberg and Edward L. Schulman of the State University of New York here.

"Computer programming is an individual as well as a social activity, in short, a human activity," they said.

Recounting the techniques used to teach programming to students who range from novice to experienced programmers at the School of Advanced Technology (SAT), Schulman and Weinberg emphasized that the objectives of a specific program should be clearly stated and understood.

Working toward assumed objectives, or those qualities of a program that the programmer believes to be important, "can be an asset but more often than not, turns out to be a liability," they said in a recent paper.

"We often wonder how many projects are behind schedule because of the programmer who can't get his/her 'fast subroutine' to work in a program to be used every six months."

Programmer attributes they have found that can significantly affect or even define program and programmer "quality" include:

- Language flexibility

Spotlight on Personnel

knowledge of programming as well as languages; ability to learn new languages and new language features.

- Problem-solving ability – communication skills, ability to draw out the definition of a problem, heuristic skills, etc.
- Dedication.
- Programming speed.
- Ability to meet deadlines.
- Pays attention to detail.
- Perspective.
- "Ego-less" attitude – teaches and learns from peers, can give and take criticism.

Each of these programming goals often conflicts with the others, they noted. "Understanding their relationships and relative importance in a particular project should dictate the degree of effort directed toward meeting one more faithfully than the other," they said.

The courses at SAT incorporate a desire to change behavior rather than to simply impart facts.

In the introductory course, in which both APL and PL/1 are taught, the students are taught the techniques of "structured programming" in order to learn "program readability."

"Reading programs" is the single most effective way to broaden their skills in debugging, their understanding of new features of a language, their concept of what other programs and programmers are doing, and their awareness of good or bad programming style," they said.

A methods and applications course, designed as a "perception" course, focuses on the interrelationships of algorithms, hardware, data structure and rules.

The students work in three-person teams, reading and criticizing each others' code, learning from others' mistakes.

In the heuristic problem-solving course, the goal is to develop creative attitudes toward problem solving. In addition to problem definition, the students are also confronted with the need for problem resolution.

Programming 1 uses PL/1 as the language.

Many students enrolled in Programming 1 already have programming experience. In order to convince the students they too have something to learn, the instructors "intimidate the student on his/her terms – through programming."

Here the instructors rigidly insist that projects must be "correct" and completed programs returned to students until they are correct. "In teaching over 300 professional programmers, not one has ever handed in a perfect program on the first try," they said.

Students then proceed to work in the team environment in which they examine each other's and the instructor's programs.

Ease of modification is demonstrated by having each team take another team's "working" program and try to modify it. Also, each team has to modify its own program after it is halfway through another problem.

Shift Schedules Irk UK Operators

(Continued from Page 58)

cold meals. And one depended on the "Chinese chip shop over the road."

Shift work presents special problems for women. More than 60% of the firms surveyed simply did not employ women on shift work. Half of those who employed women on shift work restricted them in some way; the two most common limitations being an earlier quitting time and requiring either two women on a shift or not permitting one man and one woman alone.

The result is to effectively exclude women from one of the important career paths in the computer industry. Of the firms surveyed, for example, only one-quarter has female operators. The report noted this could be a much more serious problem when antidiscrimination laws come into effect.

The report is available from Computer Economics Ltd., 1 St. James Cottages, Richmond, Surrey, England, for about $24.

Tab's new Punch/Verifier provides a sophisticated electronic key entry system utilizing the flexibility, simplicity and low-cost of punch cards. Hundreds of data processing installations have switched to Tab's Punch/Verifier with dramatic results.

029, 059 users – Reporting 20 to 40 percent increases in throughput with no complex system changes, no lengthy learning process for operators.

Buffered keypunch users – Reporting greater operator speed and efficiency with Tab's exclusive features such as: Automatic Program Sequencing! Automatic punching of up to 240 characters of repetitive data! Automatic Error Correction!

Other data Entry Methods – Tab's Punch/Verifier has the built-in advantages of the more costly and complicated key-to-disk, key-to-tape and direct entry systems. Designed for maximum operator comfort and efficiency, the Punch/Verifier optimizes the skills and techniques of your present keypunch operators.

Now available in most cities. Call your local Tab office for a demonstration. The performance features of the Tab Punch/Verifier will quickly convince you that this is truly the best of everything in data entry systems. Tab Products Company, 2690 Hanover Street, Palo Alto, California 94304. 415-493-5790.

TAB
PRODUCTS CO

er

Toward More Practical Preparation

All Involved Must 'Come Together' to Upgrade Training

By Molly Upton
Of the CW Staff

SAN JOSE, Calif. – Industry, colleges, manufacturers' schools and private DP schools should "come together and agree on a system of DP education that is mutually beneficial to the educators, the potential students and the industry as a whole," according to Gopal K. Kapur of the School of Business at San Jose State University here.

Kapur's corollary to Gresham's law ["Bad money drives out good"] indicates the pressing need for upgrading personnel training in business data processing. The corollary states: "Because of their enormous number, poorly qualified programmers and analysts circulate more freely than – and will eventually replace – their well-trained counterparts."

Although making DP courses in colleges more comprehensive and oriented towards practical use in business is also needed, more immediate returns can be gained through in-house training, he said. Kapur is speaking on DP education at an NCC session this week.

In-house training as widely practiced is in many ways similar to preparing "instant potatoes," Kapur said.

"What you get is a substandard product; in fact, you have created the 'instant programmer.'"

Sink or Swim

Many places select programmers from employees or applicants on the basis of an aptitude test and have them attend a two- to three-week class given by the computer manufacturer. They are then placed in the DP department to start programming, he said.

During this training the student learns how to code – not even to code well – with the main emphasis on programming languages, while the basic DP concepts are overlooked, he said.

While recognizing that at many firms it may not be possible to institute formal training programs, "most installations will need to develop some type of organized approach if they are to survive the increasing shortage of well-qualified data processors."

DP Education: Acute Crisis

For instance, he said, firms could:

- Conduct formal classes in areas that tend to be formalized, such as programming languages and introductions to hardware and software.
- Hold informal one- or two-hour workshops once a month to deal with topics of limited relevance to most DP employees, such as program debugging or use of certain utility routines.
- Invite experts from other companies, consultants and qualified DP teachers to discuss various topics such as data structures and file organization techniques.
- Hold occasional seminars for which students prepare different topics.

"In-house training requires considerable thought, planning, and commitment by the top executives, time and effort by the DP staff and inevitably, a definite financial outlay.

"However, such efforts will pay big dividends . . . " Kapur said.

Colleges Best Source

In the long run colleges and universities are the best means of producing well-qualified DP professionals, Kapur noted, stressing the need for interaction between the business community and colleges and universities to improve their DP curricula.

The DP community should help, through whatever means necessary, by setting up scholarships, contributing expertise, excess computer time and/or financial aid to establish business DP curricula and adequate facilities in colleges.

Colleges should seek advice and help from the industry in designing courses, he suggested, even to the point of hiring knowledgeable people from the industry.

"One of the greatest enigmas is the gross failure of colleges and universities to involve themselves in the development of business data processing science," he remarked.

Courses need to concentrate on business DP systems design, analysis methods, programming logic and techniques, business math, data structure, as well as equipment selection and software evaluation, he said.

Many colleges currently have computer science departments that are oriented towards the engineering and scientific uses of computers.

Industry should also offer programs giving college teachers firsthand experience in business DP, through in-house training during the summer and occasional workshops, Kapur said.

Upgrade DP Schools

The data processing community also has a role to play in upgrading the education available in commercial DP schools, by drawing up workable standards for private schools which should be made available to the public, vocational counselors and the press, Kapur said.

The DP community should also indicate to these schools their future and current job requirements for trainee level personnel.

Kapur found the private DP schools try to "teach too much too fast to students who are simply not qualified. . . . The main emphasis is on theory, and very little is placed on the practical side of business DP expertise."

Students in these schools, he said, generally do not receive much preparation for the actual business environment for which they are heading.

Talk to your mini's with Panasonic punched card/badge reading Data Entry Terminals

Talk directly without intermediary line controllers or pollers. Direct to your minicomputers. Offline to paper tape, teleprinter, or cassette mag tape. Or direct to your central data processing unit. Panasonic punched card and badge reading Data Entry Terminals are the unique source-data collection devices that fit into your *existing* EDP system. Just take a pair of wires from the TTY or RS-232-C data communications interface of your mini, offline recorder, or CPU and hang as many Panasonic Data Entry Terminals across the wires as you like. Amazingly enough, there's no need for any external line controller, multiplexer, or polling device. When more than one terminal is used simultaneously, each will wait its turn to read into the computer. Panasonic Data Entry Terminals are now available off-the-shelf for immediate delivery. And they're made in the United States, so service is no problem.

Take a look at some of the features and applications of Panasonic Data Entry Terminals:

Standard Features Full TTY or RS-232-C compatibility • 110 to 1200 baud • 10 characters of alpha-numeric card/badge data entry • Ultra reliable optical static readers and C-MOS ICs • Small size (12" x 9" x 6") and lightweight (10 lbs.)

Optional Features ACK/NACK computer reply • Automatic card eject • Up to 22 characters of card data and 18 digits of variable data entry • Central time clock and visual time display • Wall mounting bracket

Applications Time attendance • Labor reporting and job cost analysis • Production control • Work order entry • Inventory update • Access control

To find out more about talking high grade, real time data to your minis, offline recorders, and to your CPU, send in the coupon. Panasonic®
our technology is all around you

Matsushita Electric Corp. of America
Industrial Division
200 Park Avenue, N.Y., N.Y. 10017
Telephone: (212) 973-8907
Attn: Ken Terasaki

☐ Please send D.E.T. literature.
☐ Please call at

Name _____
Title _____
Company _____
Address _____
City _____ State _____ Zip _____

See Data Entry Terminal at the National Computer Conference, Booth #575

'Please Bear With It . . . We Want to Be Sure You're Compatible With This Unit'

Mini Rides the Rails To Figure Track Wear, Plan Maintenance

CHICAGO – A computer is "riding the rails" for the Atchison, Topeka and Santa Fe Railway Co. here to determine wear and tear on railroad tracks.

The computer, a Data General Nova 1220 mini, is used with a sensor system to gather and process data that helps Santa Fe's track engineers plan track maintenance.

In operation, a "track geometry car" uses optical encoders and contact feelers that measure warp, surface of rails, gauge, superelevation, rail alignment and lateral and vertical acceleration.

These measurements are then converted to electrical signals for transmission to the recording equipment inside the car. Moving at normal railroad train speeds – up to 80 mile/hr – the car takes measurements with the track in a dynamically loaded state, lending a greater degree of accuracy to the resulting data, a spokesman noted.

Voltages transmitted by the measuring equipment are received by two parallel sets of instruments. One produces traces on an analog strip chart; the other feeds data to the computer. Additional data such as mileposts, distances and key landmarks are entered through separate analog channels to geographically "position" the track measurement for future maintenance efforts.

Tracks Rated

On board the moving track geometry car, the Nova 1220 monitors incoming data channels, stores the information on fixed-head disk and magnetic tape, and issues reports of priority locations – those areas that need immediate attention – with a 500 char./sec line printer. The printer also produces one-mile summaries of each type of defect and an overall rating index for each mile of track covered.

Inside the car, a Santa Fe maintenance-of-way supervisor monitoring the printouts can immediately notify local repair personnel of priority locations. If a section of track is given an unsatisfactory rating, the roadmaster can stop to make an on-the-ground inspection.

The data acquired by the minicomputer and stored on magnetic tape is eventually processed off-car and compiled into a master track file to be used for planning long-term maintenance programs and rebuilding.

The Santa Fe also plans to use this information to determine performance of cars traveling at different speeds, operating levels for maximum passenger comfort and guidelines for the design and maintenance of future railroad cars.

IBM's* diskette might be as good as ours. Problem is, it costs more.

Nashua's performance-proven Diskette is directly interchangeable with IBM's own diskette for the IBM 3740, IBM 3540, and similar flexible disk drives. If there's any difference in performance, it's that some of our specifications may exceed IBM's. The reason: Nashua's extra-critical quality control.

There is one real difference, however. The Nashua Diskette definitely saves you money!

A long-lasting Mylar** disk, the Nashua Diskette is permanently enclosed in a protective plastic jacket. It can store 1,943,552 Bits of data, and unlike punched cards, this data can be changed, updated or corrected. This makes it possible to use the diskette as a storage device or as a reusable component of your data system.

Get the full story on Nashua's 100% certified Diskette. Send us the coupon; we'll send you the facts.

Nashua Corporation
Computer Products Division
Nashua, New Hampshire 03060

I'd like complete information on the dependable Nashua Diskette. Please send me complete details, including specs.

Name_____
Company_____
Address_____
City_____ State_____ Zip____

NASHUA

*IBM is a registered trademark of International Business Machines Corporation **Trademark of E.I. du Pont de Nemours and Co., Inc.

Who can sell computers in Japan?

In Japanese it's called **Shukan Computer.** In English, it means **"Computer Weekly".** Whatever you call it, it's an excellent vehicle for marketing EDP products and services to the second largest EDP market in the world (and the fastest growing).

A joint venture of **Computerworld** and Japan's leading electronics publisher, Dempa Publications, **Shukan Computer** is the first computer newsweekly for Japan. Its initial circulation of 35,000 is divided 80% to end-users and 20% to the computer industry, so Shukan goes to the people you want to reach in a market which is growing at a rate of 23% a year in installed value.

The latest census of general purpose systems revealed that there were 14,806 systems installed as of September, 1972, a 1-year gain of 3,569 units and $911 million in installed value. 1972 imports were over $360 million, so there is a lot of business being done by U.S. firms.

With **Computerworld** representatives across the U.S., it's easy to advertise in Shukan. Just send in the coupon. We'll send you media information and a free copy of our Market Briefing Bulletin: "EDP Marketing in Japan".

Shukan.

To: Neal Wilder, Vice President Marketing
Computerworld
797 Washington Street
Newton, Mass. 02160 (617) 965-5800

Please send me more information on Shukan Computer and marketing in Japan.

Name_____
Title_____
Company_____
Address_____
City_____ State_____ Zip_____

Mohawk Data. A Network Approach to data entry.

See it at NCC–Booth 551.

The Network Approach to data entry.

It's really a natural from Mohawk Data. Because we're recognized everywhere as a very powerful force in data entry.

Today, that includes all forms of data gathering and preparation. Including communications.

Our gear spans the broad reach from stand-alone terminals through sophisticated key-to-disk. And from document preparation to data collection networks and systems.

Which means we can look at your data entry problems in their totality. And offer an objective solution.

In fact, the data entry needs of all your EDP locations—central, remote, large or small—can be met by a single network of MDS systems.

The Network Approach.

Each system compatible with the others, with interchangeable media. Each capable of working with the others, with common languages. Each conveniently compatible with the major mainframes.

The Network Approach. It works. See it on display in the MDS booth at the NCC. Our new 2300 terminal and document processing systems. Our 2400 with key-to-disk, RJE, conversion, printing and concurrent combinations. And our 4400 data collection system.

If you can't be there, talk to an MDS representative now about our Network Approach to data entry. Or write for our descriptive brochure. Mohawk Data Sciences Corp., Utica, New York 13503.

MDS®

Mohawk Data Sciences

CI Notes

ICL to Join CPI

NEW YORK – International Computer Ltd. (ICL) intends to join Control Data Corp. and NCR as an equal partner in their joint venture firm, Computer Peripherals, Inc. (CPI).

The enlarged CPI would include the establishment of combined research and development facilities within the UK. CPI currently has four plants in the U.S. for manufacture of peripherals for its parent companies.

The agreement in principal calls for an investment by ICL of about $20 million.

Honeywell Minis Going Turnkey?

WELLESLEY, Mass. – Honeywell appears to be ready to market some of its minis as turnkey systems for specific applications, following the trend set by Hewlett-Packard. Announcements of Honeywell turnkey systems are expected sometime in June.

Penny Automates Catalog Orders

HOUSTON – Texas Instruments, Inc. has received a contract from J.C. Penney Co., Inc. for 800 computerized order-entry terminals and four pollers to be used for a catalog order-entry and communications system.

Each in-store terminal consists of a Silent 700 Model 733 terminal, Model 960A mini with 8K words and a modem for 1,200 bit/sec transmission.

Amminet Uses Hazeltine CRTs

GREENLAWN, N.Y. – Remote Computing Corp. has contracted with Hazeltine Corp. for the lease of 250 Hazeltine 2000 CRT terminals for use in the Automated Mortgage Market Information Network. The Amminet system matches buyers and sellers in the mortgage market.

The contract contains an option for 150 additional terminals.

Residents Oppose IBM Copter Pad

RIDGEFIELD, Conn. – A group here has collected between 1,500 to 2,000 signatures to ask the town's zoning commission to bar a helicopter landing pad planned by IBM at a future training site. Ridgefield has about 18,500 residents.

The group, called Committee to Save our Serenity, claims Danbury airport is about five minutes away.

An IBM spokesman said the firm is "continuing to cooperate with the town in its study of the situation. We want to do the right thing."

Supershort

Computer Automation, Inc.'s Test Systems Division has received orders for 11 Capable Tester Systems from several mainframe and peripherals manufacturers.

Lessors, Maintenance Beneficiaries

GSA to Discontinue Sole-Sourcing of DP

By E. Drake Lundell Jr.
Of the CW Staff

WASHINGTON, D.C. – The General Services Administration (GSA) last week revealed it would discontinue its practice of issuing Federal Supply Service contracts with IBM, Honeywell and Univac for most mainframes.

The move would prohibit any government agency from contracting on a sole-source basis with those firms, thus opening up the government market to competition from leasing and other firms in the business.

In addition, the agency said it would also take most maintenance out of the contracts, thereby opening the door to independent maintenance competition on federal contracts.

GSA also said from now on it would treat conversion of rented equipment to a purchase base as a new procurement – thereby opening it up to bids from third parties.

The move – if carried out to its fullest extent – may serve to wean firms such as IBM and Univac from "easy" government contracts by requiring computer-using agencies to open up bidding on almost all computer procurements instead of sole-sourcing through the Federal Supply Schedule contracts, sources here said.

Lessors' Gain

Particular beneficiaries of the new rules, the sources said, should be computer-leasing firms which have been pressuring the government to remove computer purchases from the FSS contract system for years.

Revelation of the new ground rules came in a letter from M.S. Meeker of the GSA to James Benton, executive director of the Computer Lessors Association, which has been leading the struggle to get more open bidding, particularly in reference to IBM 360/370 systems.

The letter, in part, stated that the GSA will "discontinue ADP schedule contract coverage for:

"(1) All IBM System 360/370 equipment, including individual machines.

"(2) Honeywell H-200 and H-6000 Series, and G400 and G600 Series central processors.

"(3) Univac 1100 Series central processors."

In addition, the letter stated the GSA will "discontinue ADP schedule contract coverage for maintenance of government-owned equipment of the following manufacture: Burroughs, CDC, DEC, Honeywell, IBM NCR, Sperry Univac and Xerox."

It also stated that "conversion of rented systems is considered to be new procurements," from now on.

In the past, government computer users had been allowed to convert their rented installations to purchased installations without going outside for bids from such organizations as computer lessors or used equipment dealers.

The Computer Lessors Association, in a long-term fight with the GSA, had contended that such changes without competitive bidding had cost the government "millions" in unnecessary expenditures.

In the maintenance area, the GSA noted it would establish a Basic Ordering Agreement for firms offering maintenance, where each firm would have to list its prices for different classes of maintenance service.

Foreign Markets More Promising Than U.S., Cary Tells Meeting

By Molly Upton
Of the CW Staff

ST. LOUIS – IBM's market possibilities overseas are even more promising than in the U.S., Chairman Frank T. Cary told stockholders at the firm's annual meeting here.

"Many countries are only now beginning to use products like ours," he said. However, overseas markets are "not without their problems" such as inflation and nationalism, he added.

In a review of the events of 1973, Cary noted the change in the structure of World Trade Corp. was the result of the unit's success.

Since 1950, World Trade's revenues have grown from $51 million to $5 billion in 1973, and last year it contributed more than 50% of IBM's total revenues.

Cary called the System/3 the most popular computer in IBM's history, with over 20,000 installed as of the end of 1973.

For the future, IBM believes "much of the promise for the future of DP lies in the area of terminal systems."

In addition to technical achievements by IBM, Cary noted the firm is continuing to study means of protecting data through codes, etc., and said it is "equally important to discourage the collection of information not needed.

"Employers can do much to assure only necessary information is collected," on employee salaries and benefits, Cary said.

The year 1973 was "a very good year for IBM, with a record number of shipments and a backlog of orders larger than at year-end 1972," Cary said.

"With the severest effects of the energy crisis past, most economists believe the economy will overcome a soft first half and will be on the way to renewed growth in the second half. Based on this forecast and our own good first quarter report, we feel optimistic about the balance of this year," he said.

Cary reviewed the status of several lawsuits, and traced developments in the Telex suit.

"We are convinced the Telex decision was based on serious errors of antitrust law and misinterpretation of IBM's business practices," he said. "IBM has competed fairly and within the law, and it's on that basis that we are asking for the Telex antitrust decision to be reversed," he commented.

(Continued on Page 64)

Industry Groups Push Free Trade

By Nancy French
Of the CW Staff

WASHINGTON, D.C. – Representatives of the computer industry have called for legislation to help expand the export of U.S.-manufactured computers and peripheral equipment worldwide, including the Soviet Union and East European countries.

Speaking for the Computer Industry Association, A.G.W. Biddle charged that the "national security" has been used as an excuse for restricting the export of nearly every type of computer or peripheral equipment to East European countries.

"U.S. efforts at this time should be directed toward expanding peaceful trade with the Eastern Bloc, but present trade bills wouldn't encourage such moves," Biddle said.

Speaking on behalf of the Computer and Business Equipment Manufacturers Association (Cbema), Peter F. McCloskey, Cbema president, and Robert D. Klages, chairman of the Cbema Foreign Trade Committee and Counsel, Sperry Rand Corp., warned, "If we cannot adapt U.S. export control policy to the needs, U.S. participation in this market will be self-limiting. In that case, the need will be met either by internal development or from increasingly available alternative sources."

The three testified before the Senate Subcommittee on International Finance of the Committee on Banking, Housing and Urban Affairs.

Biddle criticized a bill under consideration saying it would "give the President authority to curtail exports by whatever methods of regulation he deems appropriate.

"The Export Administration Act is already fraught with too much secrecy, unresponsiveness and unbridled discretion," he said. "This proposal is so broad

(Continued on Page 64)

In the Single-Source Computer Service Business, it's Put-up or Shut-up.

We're putting up. We've got a service office network throughout the free world. Each with an experienced technical staff. And the best logistic and technical support in the business. Because we intend to be the best remedy for service headaches that mix'n'match system owners, users and leasing companies can find. And we'll make manufacturers think twice about pouring effort and money into an internal service capability.

We're Raytheon Service Company. We *know* the service business. That's why we're putting up. Try us. Contact Mike Salter, Commercial Marketing Manager, Raytheon Service Company, 12 Second Avenue, Burlington, Mass. 01803. (617) 272-9300.

RAYTHEON

We're Putting Up.

Foreign Markets More Promising Than U.S.--Cary

(Continued from Page 63)

"If lowering prices to a 20% profit margin is considered predatory, our antitrust laws are being turned upside down. They were drawn up to encourage the kind of price competition that benefits customers."

"The central issue in the Telex case confuses the right of a company to take perfectly ethical actions in order to compete," he said.

"I don't think it's correct to narrowly define the market," he said, observing the market in the Telex case was limited to peripherals compatible with IBM central processors.

"We intend to fight and have faith in the ultimate fairness of the judicial process," he said.

IBM is a dynamic company, employing 274,000 people, Cary told stockholders. In 1973, the firm hired 12,700 new employees in the U.S., and a significant number were women and members of minorities. "IBM has an equal opportunity program shareholders can be proud of," he said.

During the question and answer period, Cary noted that during the last five years the percentage of domestic employees from minority groups rose from 6% to 10% and the number in management more than tripled from 300 to 945, while those in sales rose from 6% to 8%.

The number of women in management positions rose from 235 to more than 700 and in sales from 1.5% to 4.5%, Cary said.

Cary laid out some ground rules for the conduct of the meeting, directed rather specifically at Mrs. Evelyn Davis, who refers to herself as the number one minority stockholder.

"I am not going to allow any personal remarks in this meeting. I warn you," he told her.

Undaunted, she retorted, "Frank, you're the first IBM chairman I've been able to get along with."

The meeting was notable for its lack of terse remarks from the chair.

CW Photos by M Uptgn

Tom Watson Jr. enjoys meeting from vantage post in audience with codirectors Scranton, left, and Williams.

Mrs. Scranton tries out Consumer Transaction Facility, as her husband looks on.

Many Issues

Davis commented on a wide range of issues and nonissues, including the absence on the proxy statement of names of proponents of motions, possible political contributions by members of the board of directors, conflicts of interest by directors and theft of trade secrets.

Davis, wearing a New York Yankees baseball cap, also suggested that Henry Aaron be considered as a token nomination for a post on the board of directors, noting it was token because he didn't have a chance of gaining a seat. Cary accepted it as a recommendation to management.

Davis asked if any of the directors had been asked for contributions by either major political party. Cary said IBM as a firm had made no contributions at any political level and it hadn't asked directors if and how much they had personally made.

When asked about the transfer of trade secrets from IBM to other companies, Cary observed that IBM has tightened security but that it is trying to achieve a balance so that security is high enough to prevent leaks but not so high that it inhibits development.

South African Question

Within the last three years the presence of IBM in South Africa has come under scrutiny by various religious groups, and a resolution was introduced this year by the Domestic and Missionary Society of the Protestant Episcopal Church calling for establishment of an independent review committee appointed by the board to report on the situation in South Africa.

"The essential question is if IBM presence has positive effect on nonwhites" in South Africa, Cary said. He noted IBM has increased the number and percentage of blacks employed there from 4.2% in 1970 to 9.3% in 1974, with a total nonwhite employment of 11%.

"We don't say we are a great force; we believe we are a positive force." IBM is working with the government in running courses for urban blacks in typing, keypunching and computer operations, he said.

While IBM management opposes the church's motion, the disagreement with the Episcopal Church is a "matter of degree" as it feels the review committee would duplicate the company's efforts, Cary told the meeting.

A motion by the National Council of Churches called for publication of information on employment of minorities, women, etc., in nine occupational categories for the past three years. The proposal also asked that data on local operations be made available.

Cary said management opposes this because it could lead not only to invasion of employee privacy but also the information could be of use to competitors.

These two motions, plus one by Davis requiring that all annual meetings be held in New York State, were defeated.

Industry Groups Push Free Trade

(Continued from Page 63)

as to be objectionable."

All advocated cleaning up and simplifying administrative procedures so that they reflect the realities of the marketplace.

Biddle suggested removing from control "those items which are generally available to Eastern countries from other sources."

He added that policies and procedures should be changed to reflect the increased volume of export activities and the change in attitude toward trade that have occurred since 1969.

"While our national policy has changed 180 degrees from sell nothing to Eastern Bloc countries to one that encourages free and open trade, the same procedures must be followed under the Export Control Act that existed five years ago," he said.

"Particular requirements in licensing," he said, "should apply only to the most advanced technologies," which Biddle described as "a narrow band of sophistication at the leading edge of development rather than a broad band extending several years into the past."

He recommended that end-use reporting be required after delivery rather than before.

"While the supplier of a full system may have a use clearly identified at the time a sale is made, a supplier of peripheral equipment, who often sells to a system assembler rather than an end user, may not know what end user will claim the completed product," he explained.

Manufacturers:
Sell the lucrative foreign market.
Next door.

The Mexican computer market is small by U.S. standards. But don't continue to overlook it. It is booming. A nice, orderly boom for computers, peripherals, software, supplies. Matching an annual growth of the economy of 6% for the last six years. That's second only to Japan.

A MARKET TO GET INTO

Mexico, which has the world's most stable currency, also has a solid, modern democratic government. The economy is free from erratic policy changes, outlook, and cyclical swings. The Mexican Government alone is a major computer and peripheral buyer. It owns and operates 30% of the entire manufacturing sector. Other computer users: mining, engineering, retailing, banking, finance, education, business, armed forces.

UNA EXPOSICION MUY IMPORTANTE

Trade shows are no everyday thing in Mexico. Or Latin America. The government and business communities take them seriously. The INTERNATIONAL COMPUTER EXPOSITION FOR LATIN AMERICA is the World's Series of the Latin American computer field.

Everyone who is anyone in electronic data processing and communications attends. Military brass. Economists. Bankers. Government officials and business executives and their retinues. They all attend. Every year. Each day of the show. This is a major knowledge-gathering, information-absorbing, equipment-viewing, order-placing four day computer marketplace.

GRINGO! GET THE FACTS.

You ought to know more about the Latin American prospects for your firm. We can help you to decide if you should exhibit. And how to go about it.

We'll tell you about the Mexican computer market, and how it can give you entree into the burgeoning Latin American market as well.

Call or Write Today:

SEYMOUR A. ROBBINS,
Exhibit Manager
NATIONAL EXPOSITIONS CO., INC.
14 West 40th Street
New York, N.Y. 10018
212/564-8714.

ICELA

4th Annual
INTERNATIONAL COMPUTER EXPOSITION
For Latin America
MARIA ISABEL-SHERATON HOTEL
MEXICO CITY, JULY 23-26, 1974
Sponsored by: Socieded Mexicana de Computacion Electronica, A.C.

$500,000 Benchmark Equals $0 Contract

Mich. Bidding Procedures Leave Univac in the Cold

By Molly Upton
Of the CW Staff

LANSING, Mich. – Preparing for benchmarks on a system proposed for the State of Michigan cost Univac $500,000, only to have its bid remain unevaluated.

IBM and Control Data Corp. declined to bid on the system, leaving Honeywell, Univac and Burroughs as the mainframe hopefuls.

Honeywell, low bidder with a 6060, had two opportunities to run the benchmarks, while the proposal by Univac, second lowest bidder, was never considered.

Because the state originally specified benchmarks would be run on the low bidder's system only 15 days after the bids closed, vendors had to prepare for the benchmark tests before they knew if they were low bidder. Under state procedures, only the low bidder's system would be benchmarked if it met the specifications.

Willing to Invest

Commenting on the short amount of time bidders were given to prepare the benchmarks, without quarantee they'd be run, Univac's Detroit branch manager Peter Pritchard said the state explained it wanted to ensure it was dealing with responsive bidders who were willing to invest in the benchmarks.

"Based on that rationale I was extremely surprised that Honeywell was given a second chance. They were the low bidder when the bids were opened and requested and were granted an extension for the benchmark," he noted.

The Honeywell bid was $2.7 million less than the Univac bid, however, Pritchard noted, this did not include a difference in the rental rate on the three installed Univac 70/6s, the contract for which ends June 30.

In the absence of a Univac award, the units would be renewed at the standard one-year rates, whereas if Univac received the contract it was prepared to extend the current rates, which are about 30% less, Pritchard said.

Regardless of the new system chosen, the state will need its Univacs until all jobs are transferred, he observed.

Considering this factor, Honeywell underbid Univac by about $800,000, Pritchard said, noting this difference could disappear if there were delays in implementation of the Honeywell system.

It's All Relative

"The position we took was that $800,000 doesn't last very long if the conversion schedule slips. If it slips by four months, then the state has not gained a nickel," Pritchard said.

The State Subcommittee on Computers and Data Processing was made aware of this additional factor, he said, when the subcommittee gave "Univac its day in court," and heard presentations by Dr. John Dempsey, director of the State Department of Management and Budget, Univac and Honeywell.

The final acquisition responsibility rests with the subcommittee.

"As far as we're concerned, that's as far as we or any vendor should take the matter," Pritchard said.

"If we thought there was collusion or graft or something like that, obviously that would be a different matter. But in terms of fair and honest implementation of the bidding rules as seen and interpreted by honest sincere people, we took it as far as someone could take it. We didn't like the decision but we don't intend to protest it."

State Changes Rules On DP Acquisitions

LANSING, Mich. – The State of Michigan's Subcommittee on Computers and Data Processing has approved some changes in procurement procedures, effective with the next acquisition.

The new procedures will introduce a technical evaluation of proposals to try to quantify variances, explained Glenn Goodman, director of the Bureau of Management Sciences.

The new methods should alleviate some of the frustration, if not the expense, incurred by vendors preparing for benchmarks. Previously, vendors had no assurance they would have an opportunity to run benchmarks, as the state looked no further if the low bidder satisfied the requirements.

In addition to incorporating the concept of technical evaluation, the new guidelines eliminate certain aspects of the standard state contract, explained Joe Farrell, director of the Bureau of Management Services.

Purchase by Committee

A new joint evaluation committee will be named by the head of the Department of Management and Budget for each acquisition, giving increasing emphasis to the user rather than the department, he added.

"That would formalize in a sense what has been done on a very informal basis and perhaps without the same weight that it will have in the future," Farrell said.

The committee will consist of a representative of the user agency, the data center serving that agency, the purchasing department of the management and budget office, and the bureau of Management Sciences, Farrell explained.

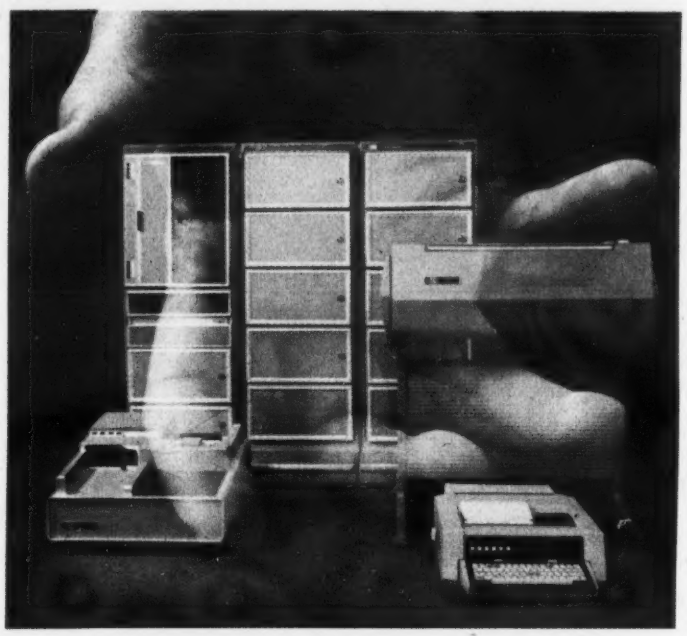
In advance of each request for quotation, the committee will establish and quantify criteria for each acquisition. Different aspects to be considered will include such items as price, running time of programs, training and space occupied by a new system, he said.

This committee would also establish in advance what aspects of the standard state contract are not applicable for each acquisition.

Possibly some specifics on time frames for bids and benchmarks will be included in the guidelines drafted by his department, he said.

Although it is not unusual in state procurement circles to look only at the low bidder's benchmark performance, he said the state is changing because Jack Dempsey, director of the Office of Management and Budget, felt the procedure did not reflect the state of the art.

Farrell said the new procedures were not prompted by any vendor comments, or with the Univac-Honeywell situation in mind, or because IBM doesn't like the state's contract, although all these factors were considered in the course of drawing up the new guidelines.



This $170,000* system gives you more computer access than any $300,000 system in existence.

HP's 3000 Minicomputer System gives you four languages: COBOL; BASIC; FORTRAN and HP's System Programming Language. A powerful Editor and File Manager. And concurrent accessibility from both terminals and batch peripherals.

This innovation works for a living.

If you do, call us.

HP minicomputers. They work for a living.

HEWLETT hp PACKARD

Sales and service from 172 offices in 65 countries.
1501 Page Mill Road, Palo Alto, California 94304

*Domestic USA prices. 22412

145 / 155 / 165
370
Two Year Leases
Pre-Owned Equipment
SAVINGS
UP TO 50%

THIRD PARTY LEASES
FOR
370's
Operational & Financial
Flexible Terms
TREMENDOUS
SAVINGS

ALL MODEL CPU'S
360
For Sale Or Lease
Peripheral Equipment
SAVINGS
UP TO 80%

COMPUTER MARKETING INC.
(215)
635-6112
7704 Seminole Ave., Melrose Park, Pa. 19126

In Small Systems

Qantel Stresses Distributive Processing

NEWTON, Mass. – The real future of Qantel Corp. and its small business systems lies in the area of distributed processing, according to Douglas Baker, president.

However, most people are talking about the concept now, but in two or three years, that concept will be reality, he noted.

In the meantime, Qantel hopes to develop about 200 distributors and establish a solid user base of stand-alone systems.

To uncork the burgeoning market for small business systems that grows with each price decrease, Qantel has bought TV ad time in three stations and is also using radio commercials.

Although ads on TV started recently they are already proving their value, he said.

300,000 Prospects

Whereas there are something like 300,000 prospects for Qantel products now, there will be about three million by 1980.

Costs of small business systems should decline from $30,000 today to $10,000 to $15,000 by the end of the 70s, he said.

As an example of declining prices, he noted that three years ago a 4M-byte disk sold for $4,000. Now, a 12M-byte disk sells for $3,000.

Part of the key is software. "Somewhere off in the future we're going to be able to give away application software," he mused.

"In the past we didn't have the technology to solve users' problems. Now the reverse is true. We can't apply the technology that's available," he said.

Margins

Firms can now ship more than what the customer expected, he said. While the 4M-byte disks were great, they weren't the answer. Now for less money the customer gets 12M bytes, which gives him a margin for sloppiness, he noted.

Small business systems makers should solve problems to make the systems easy to use. One way is to go to the user and find out what his problems are, he suggested.

As machines become simpler, it is increasingly possible to train users inexpensively, Baker said.

Qantel has learned its lessons on software, he added. "Now it's no longer true that we're going to take a bath on a new customer."

Qantel is at 3474 Investment Blvd., Hayward, Calif. 94545.

Adapso Studying Energy Guides

NEW YORK – The Association of Data Processing Service Organizations is developing industry guidelines to help conserve energy and insure uninterrupted service.

The results of the study will be translated into a program designed to help the public at large, as well as the services industry, Adapso said.

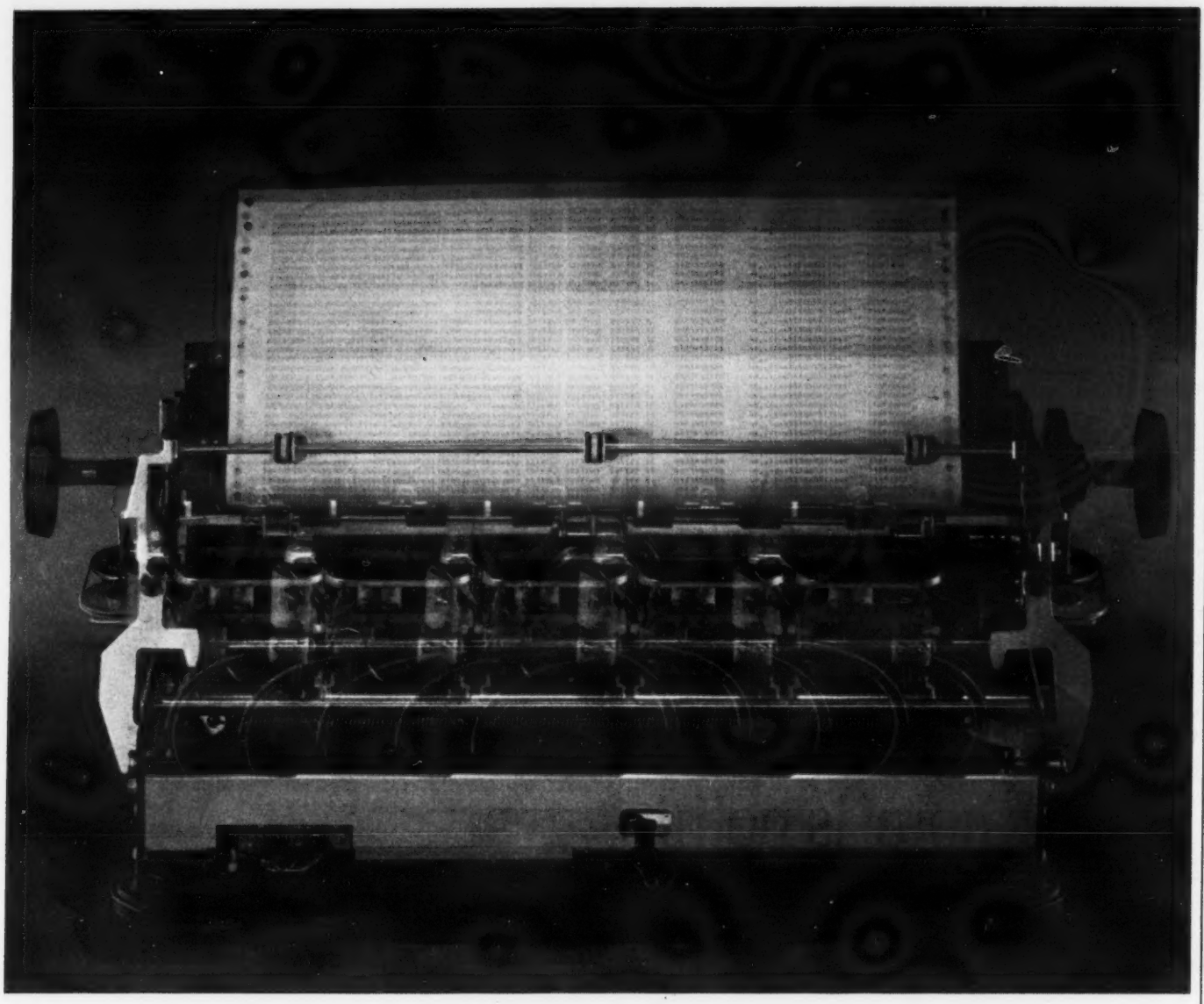
Various Factors

The study will consider various factors such as:

- Determining the most efficient air conditioning operating temperatures for each type of equipment.
- Recommending measures for dissipating computer-produced heat, through recycling for general space heating or other measures.
- Identifying operations that can be performed during the second and third shifts with reduced energy consumption, using a minimum of light and heat.
- Expediting cooperative arrangements between service centers and industrial DP operations to permit peak three shift operations and efficiency.
- Surveying energy requirements of competitive systems, with guidelines for improvement to suppliers.

"It is important to note the computer services industry is not a major consumer of energy," observed Jerry Dreyer, Adapso executive vice-president.

"The use of a data center is itself an energy conservation measure, because the concentration of EDP services in a single specialized organization permits peak level operations and otherwise promotes efficiency in the use of energy," he added.



Three times the throughput.
1/5 the moving parts.

Diablo's HyType 1 Serial Printer gives you clear, crisp printing at throughput speeds three to five times greater than the most widely used I/O typewriter. And does it with one-fifth the moving parts. Electronic servos control critical movements like character and column selection. Stepping motors control paper and ribbon feed. HyType has electronic tabbing for both horizontal and vertical spacing. In addition to greater throughput, elimination of 4/5's the moving parts assures extra long life and trouble-free performance in heavy duty operations with minimum routine preventive maintenance. Optional features include regular or pin feed platens and auxiliary form feed tractors. One and two color cloth ribbons and multi-strike carbon film ribbons are available in snap-in cartridges. Diablo's character wheel is available in 12 fonts, many languages, interchangeable in a few seconds. For the best in low-cost, high performance printers demand Diablo HyType for your system. For a complete technical presentation, write or call Diablo Systems, Incorporated, 24500 Industrial Boulevard, Hayward, California 94545, (415) 783-3910.

Diablo

"Visit Diablo's exhibit at the National Computer Show."

Diablo Systems, Incorporated
A Xerox Company

XEROX® is a trademark of XEROX Corporation
HyType and Diablo are trademarks

IBM World Trade Split Seen 'Logical' Decentralizing Move

PARIS – The move by IBM to split World Trade into two operating units, Europe, Middle East, Africa (Emea) and World Trade Americas, Far East (A/FE) is "a logical evolution of the trend toward decentralization into geographical areas," according to Jacques Maisonrouge, who has assumed his new role as chairman of World Trade Emea.

Previously, when more management structure was concentrated in New York at World Trade headquarters, he was president of World Trade Corp.

The change gives the "local geographic scene more power in the decision-making process," he said in an interview appearing in *Computing Europe*, the British Computing Society publication.

"It is very difficult for a single management team in New York to control the world," he added.

Responsiveness

One reason for the reorganization was to give the firm the ability to improve its responsiveness to customers. Maisonrouge said World Trade runs surveys of customer satisfaction, and when "we see our marks going down, we want to act quickly," he said.

Having the decision-making centers close to the marketplace enables the firm to improve customer response in "terms of hiring more people, producing special products for our customers and so on," he said.

Under the previous arrangement, he said, proposals from a field office in IBM Europe would have to be stamped in Paris, then again in New York. Decisions impacting the U.S. would have to go through the process all the way to Armonk, he said.

Most products, he said, are produced in the U.S., in Europe, and outside Europe at one plant in each area.

However, for large-volume items, such as the System/3, World Trade has manufacturing facilities in Europe, Japan and South America, as well as in the U.S.

World Trade tries to locate its manufacturing in a country "when its market is big enough and where we can avoid having a negative impact on the host country's balance of payments," he observed.

He said 90% of all parts and machines sold in Europe are produced in Europe.

A multinational firm, he said, is one that works in "many different countries at different stages of economic development, has several subsidiaries that are complete industrial corporations with manufacturing facilities, R&D, etc. Local management should be national and the regional management should be multinational, as should share ownership," he said.

International News

The new setup reduces the number of management levels from three to two, he noted.

The Emea organization represents about 69% of the revenues of World Trade and a little more than that in percentage of employees, Maisonrouge said.

Comparing gross income in the new European organization with that of the whole World Trade, he said, "We have as much gross income in Europe today as we had in the entire World Trade organization two years ago."

Too Costly

Maisonrouge noted the firm will not spread out its research and development because it is costly to proliferate and also because they've found that "as computers grow more powerful the individual market needs grow more similar, except in terms of customer-oriented products, which are adapted to selling conditions which may exist in one country."

World Trade endorses the "product by plant" concept, in which there are separate facilities to produce a particular product or several products for the entire European market.

Teheran Expo Will Show Products From 35 Countries

TEHERAN, Iran – An international licensing and new product exposition will be held here June 1-5 under the sponsorship of Patents International Affiliates, Ltd. (PIA).

The show will also introduce in the Middle East PIA's Patindex, a data bank service for dissemination of new patents, products and processes covering 21 industry segments.

Companies from 35 countries are expected to participate in the show at the Arya Sheraton Hotel here.

Australians Close to 9,600 Bit/Sec Link

SYDNEY – The day of 9,600 bit/sec transmission is close at hand in Australia, where the current maximum speed allowed by the Australian Post Office is 4,800 bit/sec, the *Australian Financial Review* reported.

Led by permission from the Post Office for Honeywell Information Systems to obtain 9,600 bit/sec modems and start transmission at that speed between Sydney and Cleveland, Ohio, 9,600 bit/sec transmission is expected to be available to those who want it by the end of the year, the article said.

The Post Office has been conducting trials with Qantas on transmission at 9,600 bit/sec over various overseas routes, and results are expected to be available within six months.

The Post Office controls and supplies all modems in Australia and is understood to be investigating 9,600 bit/sec modems from Codex Corp. Other suppliers are also bidding on a Post Office contract.

Data transmission is seen as one of the Post Office's most rapidly growing areas of business, with about 1,400 Australian users transmitting data within the country at speeds from 600 bit/sec to 4,800 bit/sec.

Using 9,600 bit/sec will mean a quadrupling of the speed available to Honeywell using the General Electric Mark III time-sharing service, which currently operates at 2,400 bit/sec.

Ray Whiteside, head of HIS time-sharing Australian operations, said about 150 of its local customers had switched to Mark III since it became available in Australia in October. He said the project was "ahead of target" to become profitable by June this year.

He expects almost all of Honeywell's 300 customers will have transferred to Mark III within 18 months.

Honeywell, he added, already has 25% of the Australian time-sharing market, and hopes to have 30% by the end of the year, with the aid of Mark III.

Processing 18,000 business transactions per hour is nothing new.
A minicomputer that does it for $80,000* is!

HP's Management 230 System lets you enter, edit, update and process transactions on as many as 32 remote terminals.
With no interim handling. And without overloading the resources of your central system.

This innovation works for a living.

If you do, call us.

HP minicomputers.
They work for a living.

HEWLETT hp PACKARD

Sales and service from 172 offices in 65 countries.
1501 Page Mill Road, Palo Alto, California 94304

*Domestic USA prices.

22413

Photographed on location at Loch Dutch, Scotland.

"Black Watch" waits for the challenge to guard.

"Black Watch" tape has a special-textured back side which guards against cinching, shifting and scratching. You get this "Scotch" 700 tape from the people who developed the first computer tape in 1953. People who will go to any length to solve a customer's problem. People who thrive on assisting. The Data Recording Products Division of 3M. A proud clan.

Call out the clan.

"Scotch" and "Black Watch" are registered trademarks of 3M Co.

3M COMPANY

Sorbus Offers Repair Courses

KING OF PRUSSIA, Pa. – Sorbus, Inc. has decided to open the doors of its training programs to students interested in learning how to repair and maintain a variety of equipment.

Sorbus has run these courses for several years for its own personnel and for students from selected OEM companies, and has previously made them available to others, but not on a large scale, observed Keith Wagerle, director of the Sorbus Education Center.

"Now we feel there's a big end-user market out there; we can do more for the end users and for the companies that are also in the maintenance business that might have an overload of students to train," he said.

Many of the attendees at Sorbus' previous training classes have been from manufacturers who want to get their employees involved in some aspects of their facility, such as production, final test, quality control or support, he said.

Wagerle said he had no idea which courses will prove especially popular, but will be interested to find out. Sorbus offers three day courses to familiarize students with the 360 and 370, and an 18-day course on the 360/30 CPU.

Other courses cover the IBM 1403 printer, 2540 card reader punch and 2821 controller, and the 2401 tape drive and 2803 controller, as well as the 2311 disk drive and 2841 controller.

Courses on several independents' peripherals are also available, as well as one on Microdata 800/1600 minis. Various courses are available on request from 875 First Avenue, 19406.

Booming Growth Seen In Process Control

NEW YORK – Sales to the process control industry will climb to $2.7 billion by 1982, up from $1.3 billion in 1972, according to a market study by Frost & Sullivan.

The energy crisis, rising production costs and stringent environmental standards are prime factors in the anticipated growth of the market for process control equipment, the research firm said.

The firm predicted that coal gasification and coal liquefication will be commercialized by 1982. By the late Seventies, Frost & Sullivan predicted, these developments should be making a significant contribution to process control equipment sales.

The process industry, however, accounts for only 80% of all process control equipment produced, the report stated. Electric utilities buy from 10% to 12%, with the remaining market spread over a variety of buyers and applications.

The major marketplace for process control equipment includes the petroleum, chemical, food and beverage, steel, pulp and paper, and the rubber, plastics and building materials industries, the study showed.

The petroleum industry, the study said, was the leading user of process control equipment in 1972 with purchases totaling $336 million. That industry is expected to spend $655 million in the field by 1982.

The chemical industry, which spent $220 million in the field in 1972, will raise that figure to $481 million by 1982, the report predicted.

Eight firms accounted for 55% of 1972 sales of process control equipment, Frost & Sullivan found, including Honeywell (12%), Foxboro (8%) and Fischer Controls (7%).

First Data, User Click On Stock Data Base

WALTHAM, Mass. – A user's need and suggestion evolved into a joint venture product offered by First Data Corp., a time-sharing firm, on its Decsystem 10s.

The evolution of Fastock, the firm's stock market analysis data base and programs, is different from some of First Data's other offerings, which are written by outside software firms.

Fastock was created by the user that suggested the project, Danforth Associates, Inc., an investment management firm, in conjunction with First Data.

The company's Decsystem 10s, a dual KA-10 and one KI-10, with another KI-10 in the works, enable First Data to charge lower rates than it could if it used IBM machines, observed Sy Morse, marketing manager for First Data.

The data base contains current and historical trading statistics for more than 11,000 securities, including daily volume, high, low and closing prices. More than 25 daily market indices for price and trading volume are available, Morse said.

From a suggestion grew a product that now has about 12 users, including mutual funds, brokerages, individual investors, investment counselors and investment management firms, he said.

Orders & Installations

Ball Memorial Hospital, Muncie, Ind., has installed an NCR Century 101 for in-patient and out-patient billing, processing accounts receivable and maintenance of the Medicare log.

Spartan Mills, a South Carolina textile manufacturer, has installed a Burroughs dual processor B6700 system for order entry, inventory, payroll and various management report applications.

First National Bank of Phoenix, has ordered an 1110 system from Sperry Univac valued at $4.3 million.

Brandon Applied Systems, Inc. has installed an IBM 370/158, replacing a Model 155 installed earlier this year.

Time Sharing System, Inc., Milwaukee, has installed a Burroughs B6700 system.

Deaconess Hospital, Spokane, Wash., has installed an MCS 100 system from Beehive Medical Electronics to provide diagnostic and monitoring capabilities to the medical staff serving the cardiac, intensive care and advanced care units.

Amoco Chemicals Corp., Alvin, Texas, has installed a Foxboro FOX 1 Process Management and Control System, Spec 200 electronic analog instrumentation and Interspec. The equipment will control an olefins plant.

Horizon Corp., Tucson, Ariz., has ordered a Decsystem-10 computer from Digital Equipment Corp. to process marketing, construction and contract data for developing Horizon communities in Arizona, New Mexico and Texas.

Jacome's, a Tuscon, Ariz., department store, has ordered 50 NCR 280 point-of-sale terminals, two NCR 723 data collectors and an NCR Century 101.

Central Michigan University has ordered a Univac 1106 to consolidate the activities of three computers presently being used on the campus.

This minicomputer gives you the data base management you'd expect on a $1,000,000 computer. It costs $78,000.*

HP's Management 260 System lets you keep from 5 million to 94 million bytes of data instantly active . . . on-line. Make application programs data independent. Eliminate data redundancy and insure data privacy.

This innovation works for a living.

If you do, call us.

HP minicomputers. They work for a living.

HEWLETT hp PACKARD

Sales and service from 172 offices in 65 countries.
1501 Page Mill Road, Palo Alto, California 94304

*Domestic USA prices. 22414

But the Compiler WILL Work

Project That Failed Leaves Memories for Loser

By Miles Benson
Special to Computerworld

Usually computer programs are built with a particular project in mind. Occasionally, like a contractor building a house without having a customer in mind, a program is built "on spec."

A few years ago, before the recession of the late Sixties wiped out computing's brave, brazen and bold, there was a large plum dangled in front of all computerdom by the military. It was a project so large, with potential rewards so high, that mere mention of it made everyone in the industry salivate.

But the price of admission was also high; the construction of a compiler for a major new programming language.

The speculative computer program this story concerns belongs to a loser.

What do you do with an unloved and unwanted computer program? If it's worth as much as this one, you look around for another project it could be applied to, and you try to use it there.

And that's exactly what this loser did.

But when a program is stuck on the shelf before anyone has had a chance to wring the bugs out of it, and the development team that breathed life into it breaks up and wafts away on the computing trade winds, what you have is, at best, an unstable program with no one who understands it well enough to stabilize it.

And so, when the loser pulled this compiler down off its shelf and plugged it into the new project, some sparks flew.

Superficially – and this probably made matters worse – the compiler was in great shape. But down at the nitty-gritty level, the compiler got its tongue twisted around its register allocations, and forgot what data belonged to what symbolic location, and tried to optimize its object code into oblivion.

In short, its beauty was little more than skin deep.

The company leading the project grew restless under this stress.

This particular project leader wasn't one to let grass grow under its feet.

If the program doesn't work, get down to brass tacks and coding pads and fix it. And that's what it decided to do.

With a neat twist. When the project leader took delivery of the wounded compiler, it has made sure that it got full ownership, which included full documentation and a reasonably complete maintenance document.

With that as a basis, a contract was drawn up for a major compiler rehabilitation project . . . and put out for competitive bids!

The original speculative builders of the program were left off the bidder list, and out in the cold.

Now you can see why it's unclear whether this is a project which failed. The project itself will live on, when the smoke clears away and the hammers and crowbars are stilled and the repair work is complete. The compiler *will* be made to work – it has to.

But the loser, who built a compiler "on spec" and lived to see it taken away, has only its memories to console it.

Adcom Elects Officer Slate

CW West Coast Bureau

LOS ANGELES – Richard G. Elzinga, general manager of The Data Corp., has been elected president of the Association of Data Center Owners and Managers (Adcom).

Other officers elected are Dave Childs of Computer Delight, vice-president; Richard E. Hillery of Gambles Datamation Center, secretary-treasurer; Les Warner of Apex Data Processing, membership chairman; and William Clauer of Intellectron, program chairman.

Adcom is a nonprofit organization of Southern California data processing companies and service bureaus that recently campaigned before the Los Angeles City Council and Department of Water and Power for certain ordinances governing electrical power usage.

Executive Corner

■ Richard De Lancie was elected vice-chairman of Remote Computing Corp.

■ Burton R. Cohn has been elected chairman of the board and chief executive officer of Xynetics, Inc.

■ Memorex Corp. has named Robert C. Stender as vice-president, product development and planning for equipment products, and George E. Dashiell as vice-president and general manager of marketing for equipment products.

■ Christian Simon has been promoted to president of Computer Machinery Corp. France, CMC's wholly owned French subsidiary.

■ J. Thiel Sullivan, president of Planning Research Corp. Information Sciences Co., has been appointed executive vice-president of PRC Data Services Co. and will serve in this capacity as an additional responsibility.

■ Joseph A. Genovese has been named vice-president and patent counsel by Control Data Corp.

■ A. William Wilbur, general manager of TRW Data Systems, has been appointed vice-president of TRW Canada Ltd.

■ Ronald L. Barbaree has been named vice-president of APL Services, Inc.

■ Desmond H. Pitcher has been elected vice-president of marketing and business planning for the new Sperry Univac European Division, headquartered in London.

■ Paul E. Payne, previously director of product planning, has been promoted to vice-president, engineering, for International Communications Corp.

■ Henry L. Tinker has been appointed vice-president, operations, at International Video Corp.

■ Kenneth I. Taylor, formerly director of engineering, has been named vice-president, engineering, at International Video Corp.

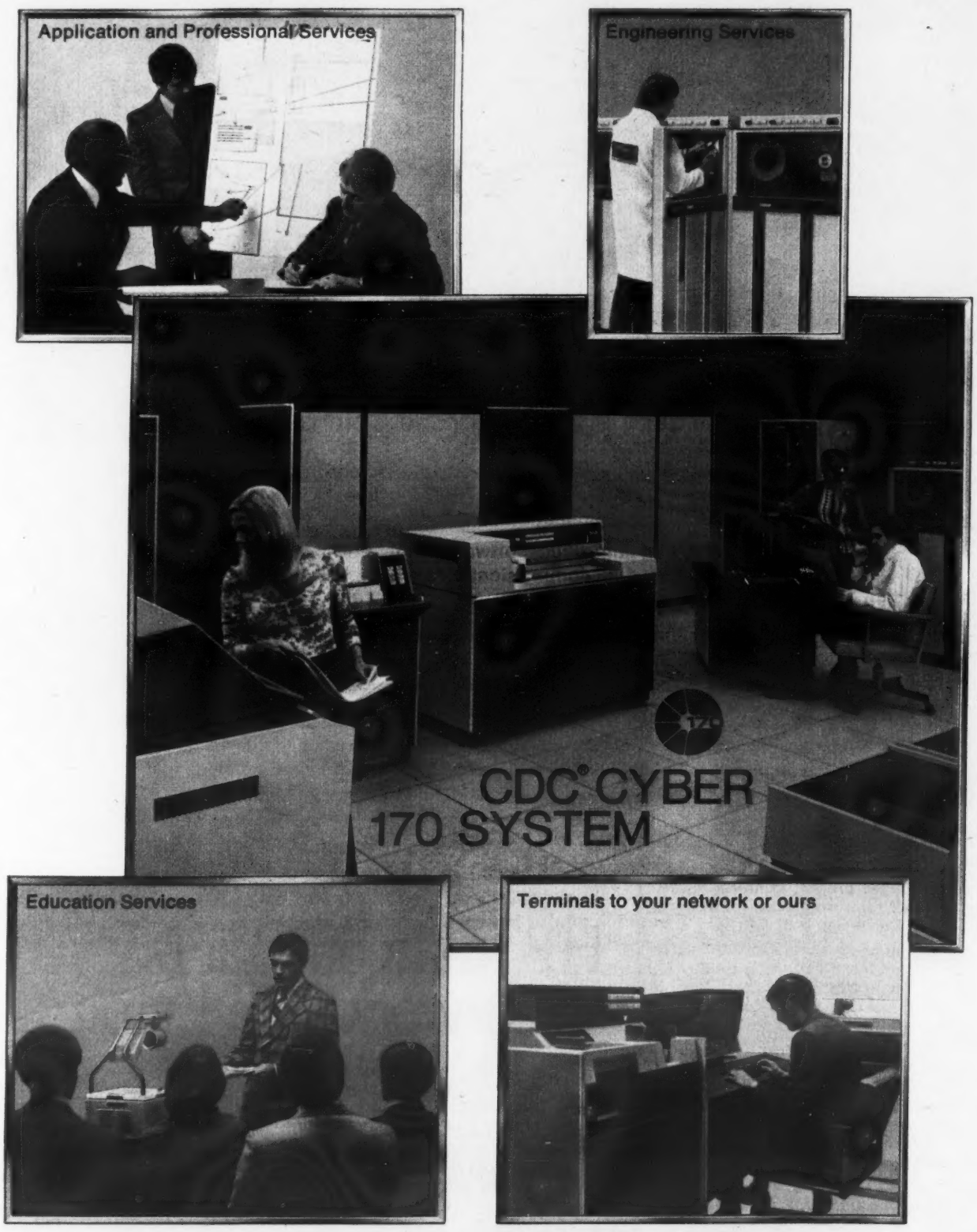
■ Charles B. Bailey Jr. has been elected vice-president of marketing for Computer Communications, Inc.

■ Stephen Sohn has been appointed vice-president, finance for Periphonics Corp.

■ Edward J. Clark, a member of MRI Systems Corp.'s board of directors, has been named vice-president, business development.

■ William H. Parsons has been promoted to the newly created position of vice-president, finance and administration, for Keane Associates, Inc.

■ Carl D. Carman has been elected director of engineering for Data General Corp.



Computer Automation Earnings Double

IRVINE, Calif. – Computer Automation, Inc.'s (CAI) third quarter earnings nearly doubled from those of a year ago and nine-month results were also up sharply.

In the third quarter, earnings of the Naked Mini maker rose to $540,258 or 32 cents a share from $272,020 or 16 cents a share in the year-ago period.

Revenues rose 81% to $5.6 million from $3.1 million in the same 1973 period.

For the nine months, earnings reached $1.3 million or 80 cents a share compared with $849,927 or 54 cents a share in the year-ago period, when there was an $184,000 tax credit.

Revenues for the three quarters climbed to $13.8 million from $7.9 million a year ago.

During the quarter, more than 700 Naked Mini and Alpha/LSI-Type 2 computers were shipped.

Data 100 Off to Good Start to '74 Goals

MINNEAPOLIS – Data 100 Corp. seemed to be off to a good start toward fulfilling President Edward D. Orenstein's predictions of a "substantial increase" in its 1974 revenues and earnings as first quarter income before special credits rose 95% and revenues 82% over the figures of the year-ago period.

The value of Data 100's 1974 product shipments should increase 40% and top the $75 million mark, he observed in the firm's annual report.

R&D expenditures for 1974 will also rise, about 60% to over $4 million from $2.5 million in 1973.

For the three months ended March 31, earnings rose to $891,000 or 16 cents a share compared with $504,000 or 9 cents a share in the year-ago period.

Both periods included tax credits of $360,000 in 1974 and $232,000 in 1973.

Revenues rose to $13.9 million compared with $7.7 million during the year-ago period. Revenue figures include sales to third-party leasing companies of nearly $5 million during the recent period and nearly $3 million in the year-ago period.

First quarter gains were the result of continuing strong demand for the firm's remote batch terminals, Orenstein said, adding that the backlog and new order rates were at record levels at the end of the quarter.

For the year ended Dec. 31, Data 100 posted record revenues and earnings, with earnings of $3.4 million or 61 cents compared with a loss of nearly $6 million or $3.33 a share in the year-ago period.

Revenues for the year rose to $42.7 million from $13.1 million last year. Monthly revenues from the lease base at year end rose 84% to $1.8 million, the firm said.

The ultimate objective for a lease/purchase mix is two-thirds "into our lease pool and the other third to consist of outright purchases by end users or other manufacturers with no sales to third-party lessors," observed George A. Reed, executive vice-president of finance and administration.

"In terms of 'retail sales value,' 45% of our shipments were leased and 55% purchased in 1973. In 1974, our objective is to ship $75 million of terminals at 'retail sales value,' half of it leased and half purchased, he said.

Reed added Data 100 has available a total of $16 million of non-recourse lease financing for 1974. "After that, we hope to be able to maintain our increasing increments of profits without having to sell to third-party leasing companies equipment we would like to retain in our own lease base."

About 25% of the firm's 1973 terminal shipments were in foreign markets, and this is expected to increase to around 35% by the end of 1974, noted Bruce Bambrough, vice-president of operations.

In 1973, the firm shipped 1,098 terminals with a retail value of $53.5 million, he said. Plans call for a third European plant to be added in early 1975.

At the end of the year Data 100 had shipped a total of 2,272 terminals since its inception in 1969.

Control Data Corporation Announces

The CDC® CYBER 170 System

A versatile new computer system from the Total Services Computer Company.

- **A computer system that performs scientific, engineering, and business data processing . . . in a timesharing, batch, remote batch, and transaction mode.**
- **New and improved software, high performance peripherals, plus new data communication systems for network processing.**
- **Separate element pricing to let you buy just what you need.**
- **Total services support worldwide, including . . .**
  - **engineering and architectural**
  - **applications development**
  - **education and training**
  - **systems analysis**
  - **maintenance**
  - **consulting**
  - **financing**
  - **CYBERNET® Data Services to supplement your own system when needed.**

Find out how this reliable and versatile new computer system — using proven computer architecture and advanced technologies — can improve your company's data processing efficiency.

Contact your local CDC sales office . . . or dial our Hot Line collect* (612/853-3535) . . . or write to Control Data, CW-54, Box 1980, Airport Station, Minneapolis, Minnesota 55111.

*U.S.A. only

CONTROL DATA CORPORATION

Stock Performance Analysis Confirms What You May Know

WALTHAM, Mass. – Investors feeling a bit burned by the vagaries of the stock market in the first quarter might find some solace in hindsight analysis by computer offered by Interactive Data Corp.

During the quarter 64.5% of stocks listed on the New York Stock Exchange and 75.4% of those on the American Stock Exchange increased in value, an average of 0.3% per share on the NYSE and 9.7% on the Amex.

But the Dow Jones Industrial Average dropped from 850.86 at year end to 846.68 on March 29, while the Value Line composite index rose 6.59%, the report said.

"While some 65% of all stocks on the Big Board posted increases in the quarter, our analysis of the 20 most heavily capitalized issues showed only six in the plus column with 14 declining, some substantially," said Jack A. Arnow, president of Interactive Data Corp.

In addition, 45% of the stocks listed on the Big Board traded between a 10% loss or a 10% gain in value. On the Amex, 31% of those listed traded in the same range.

The analysis spotlighted some Standard & Poor's industry classifications, which showed mobile homes had the highest upside activity, up 60.87%, followed by gold mining, 42.62%.

Those who feel their portfolios thinner now than at the beginning of the year may not need to be told that classifications with downside activity included the leader, offshore drilling, down 26.79%; oil well – machinery and service – 20.59%; steam generators, 19.83%; and producers of crude oil, 17.44%.

Interactive Data Corp. runs its stock performance analyses on an IBM 360/67.

Nashua DP Unit Shines

NASHUA, N.H. – The Computer Products Division was the fastest-growing unit of Nashua Corp. in 1973 in both sales and profits, the company said.

Revenues increased to $14.1 million from computer operations, nearly double those of 1972. Profit margins of the division are above the corporate average with cartridges and disk packs for the IBM System/3 and 370 Series the fastest-growing products in the division, the firm said.

Computer products represented 6% of Nashua's total sales and 11% of income before taxes for the year.

The company as a whole earned $11.6 million or $2.55 a share compared with $9.7 million or $2.15 a share a year ago. Revenues reached $224.3 million compared with $171.6 million in 1972.

Automakers, 'Digest' Hit With Antitrust Suit

By a CW Staff Writer

NEW YORK – Car/Puter International Corp. and its subsidiary, United Auto Brokers, Inc., of Brooklyn, New York, have filed an anti-trust complaint in the U.S. District Court, Eastern District of New York against *Reader's Digest*, GM, Ford, Chrysler and American Motors Corp. charging that *Reader's Digest* unlawfully conspired with these automakers to restrain Car/Puter and United Auto Brokers from engaging in free competitive enterprise by refusing to accept their advertising.

Car/Puter is a consumer service company that provides computerized lists of dealer costs for new cars, and United Auto Brokers, Inc. acts as a broker for consumers seeking the cheapest available auto prices.

The lawsuit alleged violation of the Clayton and Sherman Antitrust Acts, the General Business Law of the State of New York and the First Amendment of the Constitution.

The complaint alleged further that Car/Puter and United Auto Brokers had suffered damages amounting to $2 million and sought treble damages of $6 million plus an injunction restraining *Reader's Digest* from continuing to refuse to accept their advertising.

Car/Puter provides computerized new car prices to potential buyers for a fee of $10. United Auto Brokers, Inc. offers to buy automobiles for consumers for $125 over dealer's cost.

Armed with a detailed computer printout showing dealer cost, manufacturer's suggested retail price (sticker price), freight charges and other related information, the prospective buyer is in a stronger bargaining position when he negotiates the purchase of a new car with his local dealer.

In a letter to Car/Puter President Arnold W. Wonsever, *Reader's Digest* New York manager Burton H. Boersma explained it was "declining Car/Puter's advertising because of its direct competitiveness with automotive dealers . . ." – an important source of *Reader's Digest* advertising revenue.

"The refusal of our advertising by *Reader's Digest* and other media because of our direct competitiveness with automobile dealers not only violates our laws but shatters the free enterprise system that our country has grown on," Wonsever said.

"It is obvious that the automobile industry can apply enormous economic pressure to the media by withdrawing its advertising dollars, and while this may only be temporary, the advertising revenue lost by the media can be staggering," he said.

Dealer Boycotts

This has been evidenced by the dealers' boycott of advertising in several newspapers that ran favorable editorial coverage about Car/Puter's service.

"Hundreds of newspapers and magazines as well as TV and radio have continually reported favorable editorial coverage about Car/Puter. Yet many have refused to accept Car/Puter advertising, such as in the case of *Reader's Digest*," Wonsever said.

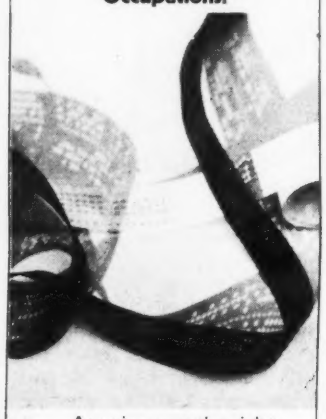
"We have submitted our advertising to approximately 50 publications and they all refused to accept it without giving the reason. They replied by letter saying, 'unacceptable,' or gave our advertising agency a verbal rejection.

"Where does the responsibility of the media lie, with its advertisers or with its readers, viewers and listeners?" Wonsever asked.

"Car/Puter's services balance the bargaining power between buyer and seller and can contribute greatly to halting the spiraling inflationary trend we are witnessing today. The suppression of our messages by the media is an injustice to the consumer as well as to Car/Puter," Wonsever said.

We know the ropes

In Financial and EDP Occupations.



Assuring you the right person for the job *and* the right job for the person.

We have specialized in Financial and Data Processing employment for over a quarter of a century, and frankly, *we're good at it.*

World's largest Financial & EDP Personnel Specialists

Alexandria, Va., 5001 Seminary Road	(703) 931 3600
Allentown, Hotel Traylor Bldg.	(215) 439 1506
Atlanta, 3379 Peachtree Road N.E.	(404) 233 2416
Baltimore, The Quadrangle - Cross Keys	(301) 323 7770
Boston, 140 Federal St.	(617) 423 6440
Charlotte, 4801 E. Independence Blvd.	(704) 535 3370
Chicago, 333 N. Michigan Ave.	(312) 782 6930
Cincinnati, 606 Terrace Hilton	(513) 621 7711
Cleveland, 1367 E. 6th St.	(216) 621 0670
Dallas, 2001 Bryan Tower	(214) 742 9171
Denver, 1612 Court Place	(303) 244 2925
Detroit, 670 Honeywell Center, Southfield	(313) 559 1212
Hartford, 111 Pearl St.	(203) 278 7170
Houston, 1200 Central Nat'l Bank Bldg.	(713) 228 0056
Indianapolis, 9 North Illinois St.	(317) 636 5441
Kansas City, Mo., 127 West 10th St.	(816) 474 4583
Lancaster, Pa., 8 North Queen St.	(717) 299 5621
Long Island, 420 Jericho Turnpike, Jericho	(516) 822 8080
Los Angeles, 3600 Wilshire Blvd.	(213) 386 6805
Louisville, 680 South 4th St.	(502) 589 6657
Memphis, 12 S. Main St.	(901) 523 8950
Miami, 1190 N.E. 163 St., No. Miami Beach	(305) 947 0684
Milwaukee, 777 East Wisconsin Ave.	(414) 271 9380
Minneapolis, 80 South 8th St.	(612) 336 8636
Newark, 1180 Raymond Blvd.	(201) 623 3661
New York, 330 Madison Ave.	(212) 986 1300
Omaha, 7101 Mercy Road	(402) 397 8107
Orange, Cal., 500 South Main St.	(714) 835 4103
Philadelphia, 2 Penn Center Plaza	(215) 568 4580
Phoenix, 1517 Del Webb TowneHouse	(602) 279 1688
Pittsburgh, Gateway Towers	(412) 471 5946
Portland, Or., 610 S.W. Alder St.	(503) 222 9778
Providence, 400 Turks Head Bldg.	(401) 274 8700
St. Louis, 7733 Forsyth Blvd., Clayton	(314) 727 1535
San Francisco, 111 Pine St.	(415) 434 1900
San Jose, 675 North First St.	(408) 293 9040
Seattle, 1215 Fourth Ave.	(206) 624 9000
Stamford, Ct., 111 Prospect St.	(203) 325 4158
Tampa, 1311 N. Westshore Blvd.	(813) 876 4191
Washington, D.C., 7316 Wisconsin N.W.	(301) 652 1960
Wilmington, 1102 West St.	(302) 652 3244
London, England, 17 Finsbury Square	01 638 4394
Toronto, Canada, 15 Toronto St.	(416) 868 1314
Vancouver, B.C., 535 Thurlow St.	(604) 688 7726

ROBERT HALF PERSONNEL AGENCIES

Position Announcements

PDP-11 SOFTWARE CONSULTING SERVICES

SENIOR STAFF PROGRAMMERS

Available for temporary assignments. Experienced in systems (I/O, Communications, Real-Time) and scientific applications. Extensive hardware background.

Also experienced in assembly language, FORTRAN, PL/I, BASIC, and SNOBOL on IBM 360, 370, NOVA, SUE, CDC 6000 series any other CPU's.

Programming may be performed on our PDP-11 System (Disk and IBM compatible, 9-track magnetic tape) or at your site.

Call or write with your requirements:
DATA SYSTEM PRODUCTS
201 Waltham Street
Lexington, Mass. 02173
(617) 891-8059 (617) LA7-0671
(617) 862-7629

SYSTEMS ANALYSTS
PROGRAMMER ANALYSTS

Highland Community College is seeking professionals for its Computer Center. Minimum experience should be 3 years of Cobol and/or Systems design. Send resume' to:

HANS J. KUSS
DIRECTOR COMPUTER CENTER
HIGHLAND
COMMUNITY COLLEGE
FREEPORT, ILL. 61032

COMPUTER PROFESSIONALS

$9,000 to $30,000 plus

ALL COMPUTERS
ALL LANGUAGES

Immediate Opportunities with Growth Firms!

Call (617) 273-0444 Ed Gagnon
E.S. RANDO ASSOCIATES
Computer Personnel Consultants
1 Vine Brook Park
Burlington, Ma. 01887
Next to Burlington Mall
Rt. 128 Exit 42

Computerworld Sales Offices

Vice President – Marketing
Neal Wilder
Sales Administrator:
Dottie Travis
COMPUTERWORLD
797 Washington Street
Newton, Mass. 02160
(617) 965-5800
Northern Regional Manager
Robert Ziegel
Account Manager
Mike Burman
COMPUTERWORLD
797 Washington Street
Newton, Mass. 02160
(617) 965-5800
Eastern Regional Manager
Donald E. Fagan
Account Manager
Frank Gallo
COMPUTERWORLD
2125 Center Avenue
Fort Lee, N.J. 07024
(201) 461-2575
Los Angeles Area:
Bob Byrne
Robert Byrne & Assoc.
1541 Westwood Blvd.
Los Angeles, Calif. 90024
(213) 477-4208
San Francisco Area:
Bill Healey
Thompson/Healey Assoc.
1111 Hearst Bldg.
San Francisco, Calif. 94103
(415) 362-8547
Japan:
Ken Suzuki
General Manager
Dempa/Computerworld
1-11-15 Higashi Gotanda
Shinagawa-ku, Tokyo 141

COMPUTERWORLD

Systems Programming Manager

Large progressive educational institution needs an energetic individual to fill recently created vacancy as a manager of Software Systems Group. Persons applying are expected to have at least one year supervisory experience along with an extensive working knowledge of OS/MVT and HASP. Please send complete resume, including telephone number where you can be contacted, along with salary requirements to:

CW Box 4083
797 Washington Street
Newton, Mass. 02160

All applications are kept confidential. Excellent benefits and working conditions. Salary commensurate with education and experience.

AN EQUAL OPPORTUNITY EMPLOYER

UNIVERSITY OF FLORIDA

A position of professor in the Department of Computer and Information Sciences is available starting fall 1974. Applicants should have a PhD in Computer Science or some closely related area as well as a minimum of five years experience teaching both under-graduate and graduate courses in a university environment. In addition, the applicant should have demonstrated significant research experience with a well established publication record. This person will be responsible for helping to develop a strong graduate program from the currently existing multi-disciplinary undergraduate program. The applicant's major area of interest should preferably be in Software Systems and Large Data Bases. Send resume to:

Chairman, Department of Computer and Information Sciences
512 Weil, University of Florida
Gainesville, Florida 32611

A nondiscriminatory, affirmative action employer

TIRED OF SELLING OR WORKING WITH D.P. SYSTEMS?

LOOKING FOR A FRESH OPPORTUNITY?

If you are bright, knowledgeable in general data processing problems and practices, have up to 5 years of experience and have a good head for business, we want you.

We are a prestigious, profitable, hard-driving team in a 9-year old firm which is best known for management-level seminars and other knowledge products. We offer compensation in the high teens, a chance to grow in business and responsibilities which will keep your hand in the d.p. field.

Send resume to

CW Box 4099
797 Washington St.
Newton, Mass. 02160

COMPUTER SYSTEMS SIMULATION

We are seeking an accomplished professional to perform configuration through-put and response time studies, real-time communication network configuration studies, and to investigate hardware/software bottlenecks in our real-time and batch multi-programming system.

Applicants should have 3-5 years experience in the use of simulation, analysis and measurement techniques as applied to computer systems configurations design and performance evaluation studies. Experience in the use of hardware/software monitoring tools is desirable. A knowledge of GPSS, SIMSCRIPT, CSS, SIMULA or SCERT is required.

For immediate consideration, please send a complete resume including current salary to:

INA CORPORATION

Corporate Information Services Division
Dept. MH
P.O. Box 36
Somerdale, N.J. 08083

We are an equal opportunity employer with a progressive affirmative action program. Minority candidates are encouraged to apply.

POSITION ANNOUNCEMENTS | POSITION ANNOUNCEMENTS | POSITION ANNOUNCEMENTS | POSITION ANNOUNCEMENTS | POSITION ANNOUNCEMENTS

DATA PROCESSING PROGRAMMER-ANALYST POSITIONS

Expanding computer applications in rapid growth company has created several additional openings in our Data Processing Division.

- Career Positions
- Professional work environment
- Individual growth and development

Two to six years experience in systems and/or programming is necessary. A four-year college degree is preferred. Excellent salary structure and fringe benefit program. Please submit resume to Personnel Manager:

FS SERVICES, Inc.
1701 Towanda Avenue, Bloomington, Illinois 61701
An Equal Opportunity Employer

CALIFORNIA POLYTECHNIC STATE UNIVERSITY SAN LUIS OBISPO

Faculty opening, Computer Science Department. Applicants must have doctorate in Computer Science (or likelihood of early completion) and two years full-time industrial/teaching experience. Minority and women candidates are encouraged to apply. Salary range: $900-$1466/mo. Send resume to:

Daniel F. Stubbs, Chairman
Computer Science and Statistics
California Polytechnic State University
San Luis Obispo. California 93407

PROGRAMMER/ANALYST

Outstanding opportunity with a major East coast State agency to participate in the development of an advanced data base application in the area of Student Financial Assistance. These positions offer significant design and development responsibilities, competitive salaries, and a superb benefit package.

PROGRAMMER/ANALYST – To develop a single data base oriented system from many existing student assistance subsystems. We seek a degreed professional with strong communicative skills, 3-5 years of increasingly responsible experience in systems analysis and design, a programming background, and knowledge of 360/370 OS and COBOL. Additional experience in DOS, FORTRAN, and teleprocessing would be helpful, but is not required. Salary in mid to upper teens.

PROGRAMMER – To provide principal software development support to this major MIS effort. The successful applicant will be degreed, with 2-4 years of 360/370 OS or DOS programming experience in COBOL. Knowledge of FORTRAN, teleprocessing and exposure to system design is a plus, but not required. Salary in mid teens.

Interested individuals are invited to submit their resumes and salary history to:

CW Box 4095
797 Washington Street
Newton, Mass. 02160
An Equal Opportunity/Affirmative Action Employer

IBM SYSTEMS PROGRAMMERS

CalComp is a leading independent manufacturer of computer peripheral equipment. Our growth rate has created an exceptional opportunity for systems programmers with experience as follows:

- **Minimum 4 years programming experience in IBM 360/370 OS/DOS internals**
- **IBM tape and disk peripheral hardware experience**
- **Peripheral and mainframe diagnostics**
- **BS Degree in scientific field preferred**
- **Works well independently**
- **Some travel required**

This is an outstanding opportunity for a Systems Programmer to gain diversified experience while enjoying an association with a dynamic growth company.

To arrange interview, call or send resume to:
Dave Elling, (714) 821-2252
2411 W. La Palma Ave., Anaheim, Calif. 92801

CALCOMP
California Computer Products, Inc.
An equal opportunity employer M/F

ASSISTANT OR ASSOCIATE PROFESSOR: COMPUTER SYSTEMS

To teach and conduct research in the general area of computer systems design for commercial and industrial application. Large scale 360/65 and expanded minicomputer available. Experience and earned doctorate required. Send resume to:

Dr. R.J. Wimmert, Chairman
Industrial Systems Department
University of South Florida
Tampa, Florida 33620
An Equal Opportunity/ Affirmative Action Employer

SYSTEMS DESIGN/
Programming Supervisor
$18,624

Seeking applicants with Masters degree in operations research, systems engineering or related field and extensive experience in systems design or analysis. Thorough knowledge of IBM 360/370 operating system required. Management or project leadership in design and installation of management information systems also required. Highly responsible administrative and professional work in planning and directing the activities of the Systems Engineering Division.

Contact Atlanta Regional Commission, 1047 — 100 Peachtree St, Atlanta Ga. 30303, (404) 522-7577.
Closing Date: May 31, 1974, An EOE

Computer Leasing Representative in New York City Area

Have a good track record in computer leasing, but facing a dead end? We are looking for your expertise to increase our leasing business. We are a publicly owned company with sound, profitable history. Send resume to George H. Heilborn, Pres. for further discussion.

IPS Computer Marketing Corp.
467 Sylvan Avenue
Englewood Cliffs, N.J. 07632

CONFIDENTIAL BOX SERVICE

FOR ADVERTISERS who do not wish their names or addresses to appear in their ads, Computerworld offers a confidential box service. To take advantage of this service, simply state in your initial order that you would like a "blind" ad. Computerworld will then assign your ad a box number and forward all replies. The cost for this extra service is only $1 per ad per insertion, no matter how many replies are received.

FOR RESPONDEES who hesitate to reply to a "blind" ad because there are certain individuals or firms to whom you do not want to reply, Computerworld offers a screening service at no cost. To take advantage of this screening service, simply address your reply to the box number specified in the ad, attach a separate list of such names, and put both in another envelope addressed to: Confidential Box Service, Computerworld Advertising Department, 797 Washington Street, Newton, Mass. 02160.

COMPUTERWORLD

Digital, the leading manufacturer of minicomputers is rapidly growing. And right now we're looking for a qualified person like you to join us.

MANAGER of SYSTEM PROGRAMMING

To guide, motivate, and inspire monitor systems programmers supporting internal computer centers. This technologist/businessman will be allocating his resources in an environment of change and unsatiated demands. He must have experience in planning carefully and accommodating quickly.

SYSTEM PROGRAMMERS

We are seeking programmers with three or more years intimacy with the operating system and a compiler at large, multiprogramming, EDP installations (using OS/MVT, GECOS III, DECsystem 10, etc.). You should be able to communicate equally well with both the users of your system and the software engineers who developed it.

PROGRAMMER ANALYSTS

Internal promotion has created several openings for exceptional individuals with COBOL experience at large state-of-the-art sites. We require a Bachelor's Degree plus at least three years experience in either manufacturing, financial, field support or administrative applications.

For consideration, please forward your resume and salary history to Annette Albright, Digital Equipment Corporation, 162 Main Street, Maynard, Mass. 01754

MONITOR PROGRAMMER

We're looking for a "real sharp" individual who is creative and innovative. With Digital you'll be working as Lead Programmer, developing communications network products, primarily on the DECsystem 10 with our advanced systems group. You'll become involved in customer special applications and unique problem solving. In short, you'll be given responsibility to utilize your talents to the fullest.

To qualify, you should have a B.S. Degree or equivalent and 3-5 years experience on large systems programming. A good knowledge of communications with prior systems design experience is necessary; familiarity with Digital hardware a plus. This position is at our Marlboro facility.

Please send your resume to Joe Daly, Digital Equipment Corporation, Dept. 508, 200 Forest Street, Marlboro, Mass. 01752

digital
digital equipment corporation

The above position is open for application to men and women regardless of race, national origin, age, religion, or creed.

POSITION ANNOUNCEMENTS | POSITION ANNOUNCEMENTS | POSITION ANNOUNCEMENTS | POSITION ANNOUNCEMENTS | POSITION ANNOUNCEMENTS

We've got a winner who needs a Marketing Manager

Our product is the ACCOUNTING IV General Ledger and Financial Reporting System. Sales are mushrooming; so much so that we are ready to open a WESTERN REGION sales office in the Los Angeles area.

Want to manage a winner? If you have a track record in selling applications software products, plus a background in accounting systems, we'd like to talk to you.

Call Walter Brown, vice president, to discuss an unusual career opportunity with the world's largest supplier of software.

informatics inc
New York: (212) 564 1258
New Jersey: (201) 488-2100
Los Angeles: (213) 887-9121

World's Largest in Software Products

Equal Opportunity Employer

WANTED
CICS APPLICATIONS PROGRAMMER

OS EXPERIENCE PREFERRED

Contact Rich Shackelford
South Carolina Blue Cross & Blue Shield
I-20 at Alpine Road
Columbia, S.C. 29219
(803) 788-3860 ext. 427

CUSTOMER ENGINEERS

Chicago or San Francisco Bay Area. Well established, profitable, publicly-owned leasing corporation seeks qualified customer engineers to maintain I.B.M. unit record equipment. Independent responsibility. Must have two years experience. Excellent opportunity for advancement, excellent salary and benefits. Please send resume and salary requirements in confidence to:

Vice President
Datronic Rental Corporation
5216 Wesley Terrace
Rosemont, Illinois 60018

ACADEMIC

POSITION IN COMPUTER SCIENCE AND SYSTEM DESIGN

open June 1 for a person to teach Computer Science and design and implement a computerized alumni information system at a four year private liberal arts and science college. Summer: full time on information system; academic year: half teaching, half information system. Master's degree in Computer Science required; data base experience preferred. 12 month salary $11,500-13,500. Send resume to **H. James Farrell, Chairman Computer Science Department, P.O. Box 56, Saint Mary's College, Winona, MN 55987.** *An Equal Opportunity/Affirmative Action Employer.*

INTERNATIONAL MARKETING EXECUTIVE

Experienced in management of sales and marketing functions in the computer and information technology fields. Background should include responsibility for marketing operations of computer, peripheral, or software service companies in Europe and/or Japan. Ability to plan international advertising and trade show research activities for companies with a wide variety of activities in the computer industry, and to present these programs to top management of computer companies headquartered in North America.

The individual selected must have sufficient depth of experience to provide strong, positive leadership to the marketing efforts of the company. Planning is an essential ingredient of the position. A primary responsibility is to work actively with the staff to expand and diversify our programs.

This is an excellent opportunity for a highly motivated individual to occupy a key position in a rapidly growing organization, already a leader in its field, and with a high long term growth potential.

Please send resume, including education, salary requirements, and work history, to:

INTERNATIONAL DATA CORPORATION
60 Austin Street
Newtonville, Massachusetts 02160

COMPUTERS • INTERDATA • MINI-COMPUTERS • INTERDATA • MINI-COMPUTERS • INTERDATA • MINI-

POSITION ANNOUNCEMENTS | POSITION ANNOUNCEMENTS | POSITION ANNOUNCEMENTS | POSITION ANNOUNCEMENTS | POSITION ANNOUNCEMENTS

FLORIDA POSITIONS

We are looking for 2-3 systems software programmers as a part of a major expansion. Require degree, 3-5 years BAL, DOS to OS conversion experience. Successful candidates will be assured of adequate computer resources as we are installing a second 360/65 in June.

This is an opportunity to join a fast growing computer service company servicing clients nationally with remote batch processing, and that has not only enjoyed substantial profit improvement each year, but has a liberal profit sharing plan for eligible employees. Please send resume with salary history and statement of career accomplishments to:

R. Eckert, Computer Power
661 Riverside Avenue
Jacksonville, Florida 32204

NCR

RETAIL SYSTEMS/PROGRAM MANAGEMENT

Do you have a background in Retail Systems? If so, you will want to apply your talents in our Retail Systems area. You would be involved with the development of systems for the retailing industry. Interested? If so, write to:

Mr. Vernon L. Mirre
Corporate Executive & Professional Placement
Dayton, Ohio 45479
An Equal Opportunity Employer M/F

MINICOMPUTER SYSTEMS ENGINEERS AND PROGRAMMERS

Brooks designs and manufacturers DIT-MCO Wiring Analyzers, the most widely used automatic test systems of this class throughout the U.S. and Europe. Proprietary system developments are being broadened and accelerated, resulting in the requirement for significant expansion of our permanent engineering staff. If you can appreciate the freedom, informality and personal recognition that a small-company environment can offer, investigate these openings:

SOFTWARE

SUPERVISORY and STAFF POSITIONS for professionals with experience in real-time on-line control systems.

DIGITAL ELECTRONICS DESIGN

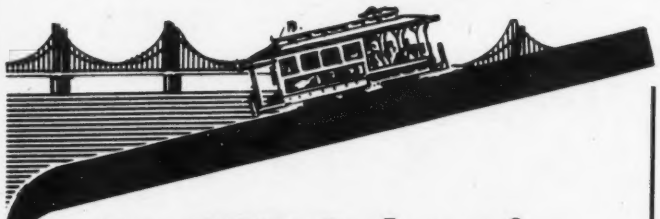
MANAGER and PROJECT ENGINEER positions associated with design of systems and subsystem components: computer interfaces, instrumentation, microcomputer controls and other design-related items.

PRODUCT ENGINEERS

SUPERVISORY and STAFF ENGINEERS to develop improved methods for configuration control and design automation, plus creation of product improvements and custom designs.

Call PRICE WICKERSHAM during NCC Chicago at (312) 372-8555 or at our plant (816) 363-6289.

BROOKS RESEARCH
5612 Brighton, Kansas City, Mo. 64130
An Equal Opportunity Employer



At GTE Sylvania REAL-TIME Software is our product.

You're invited to explore these San Francisco Peninsula career opportunities now.

Our newly formed Software Engineering Department is expanding rapidly. Programmers and Analysts who join us will help us expand the state-of-the-art in such areas as *MULTI-PROCESSING, *MULTI-COMPUTER NETTING, *DATA MANAGEMENT, *SIGNAL PROCESSING, and *OPERATING SYSTEMS.

Junior positions require up to 3 years of experience in assembly language, CMS-2, FORTRAN or a real-time oriented HIGHER ORDER LANGUAGE. A degree in EE Computer Science is desirable.

Senior positions require 8 or more years of applicable real-time experience. Successful candidates should have a proven track record in one or more of the following areas: *REAL-TIME SYSTEMS DESIGN AND IMPLEMENTATION, *MANAGEMENT OF REAL-TIME SOFTWARE PROJECTS, *TECHNICAL MARKETING SUPPORT.

Send your resume to Professional Employment Director, Dept. CW 925, GTE Sylvania, P.O. Box 188, Mountain View, California 94040. An equal opportunity employer, male/female. Minority applicants are encouraged to apply. U.S. Citizenship required.

GTE SYLVANIA

FORTRAN PROGRAMMER

Management consulting firm has opening for programmer with at least 4 years experience in diversified application. Must be willing to travel.

Engagements in a single location frequently last several months. Most of our employees receive $5,000 to $6,000 annually apartment and subsistence allowance. If you are single (or relocate your family) the living allowance is a direct increase to your salary and may be tax-free; or, if you cannot relocate your family, we have several plans for return to your permanent residence on a regular basis.

If you qualify, send your resume, salary information, and availability date to:

Management Services Company
555 Capital Mall, Suite 740
Sacramento, Calif. 95814
WE ARE AN EQUAL OPPORTUNITY EMPLOYER

EDP MGMT

Northern N.J. Publisher seeks a mature project manager with circulation and list maintenance experience to assume direct responsibility for the systems and programming functions. This position has a direct reporting line to corporate executive management.

Contact A.R. Carroll at
(212) 697-0940 or write him
at 6 E. 45th St., Room 1700,
N.Y.C. 10017

PROGRAMMER ANALYST II in COLORADO

A growing community adjacent to Denver is seeking an individual with 3 years' experience in programming and systems design, preferably in the area of teleprocessing and accounting applications. COBOL and some college is desirable. Salary range $907-$1158. Excellent fringe benefits and career growth opportunity. Please reply with resume and salary requirements to:

City of Aurora
Personnel Director
1470 Emporia Street
Aurora, Colo. 80010

ROTH YOUNG

SAN FRANCISCO

CAREER OPPORTUNITIES

SYSTEMS PLANNER $24-30,000

Mid-western Fortune 500 manufacturer seeks strong planner with line management and consulting background. Excellent potential for further growth.

SYSTEMS PROGRAMMERS $17-20,000

Several openings both in San Francisco area and throughout the country. SYSGEN experience and a knowledge of OS, DOS, HASP or CICS/IMS internals combined with heavy ALC is the basic requirement.

APPLICATIONS PROGRAMMERS $13-18,000

We are experiencing an upsurge in demand for skilled programmers. There are attractive positions here in California, the Mid-west and East. COBOL is the major need, but OS, Teleprocessing, Data Base management and assembler languages are a definite plus.

To explore these or other opportunities, contact Mr. Samuel D. Howell. All replies are held in strict confidence. Our client companies assume our fees.

Roth Young S.F. Agency
44 Montgomery Street
San Francisco, Calif. 94104
(415) 391-3865

SYSTEMS PROGRAMMERS

Breakaway to San Francisco for a new challenge.

At Singer Business Machines we have all of the ingredients for career satisfaction. We are progressing at a rapid rate with a variety of state-of-the-art products like point-of-sale terminals, hand calculators, etc. To qualify you must have 3-5 years of operating systems and assembly language programming. A minicomputer background with compiler and communications terminal experience is desirable. Excellent starting salaries, fringe benefits and paid relocation.

For consideration, send your resume or letter of application to Mr. Danny Norman, Professional Employment, 2350 Washington Avenue, San Leandro, California 94577. We are proud to be an equal opportunity employer, male/female.

SINGER
BUSINESS MACHINES

INTER ACT WITH

R.
RESOURCES

ROI offers a unique spectrum of computer-oriented services to assist both industry and end users in securing motivated computer professionals.

We maintain a staff of professional consultants who are well qualified to survey your problems and requirements, recommend a staffing structure, and recruit the competent, expert computer professionals necessary to your organization. We have extensive experience in relevant interaction with the knowledgeable, technical professionals demanded for effective functioning of both applications and development operations.

Over the past several years, we have established our reputation for competency and expertise in securing exceptional computer professionals for hardware design, customer engineering, systems analysis and design, creative programming, software development, and management.

O.
OBJECTIVES

Our primary objective is to provide a complete, professional staffing service to the computer community. Our approach is personalized to relate fully with the individual and corporate needs of our clients.

We function basically within two divisions: Engineering (Hardware) and Software. Our Engineering Division handles recruitment of design engineers, customer engineers, senior service personnel and other professionals you require in this area. Our Software Division secures the professionals qualified for systems analysis and design, software development and sophisticated programming. Both divisions are involved in keymen recruitment and executive search.

I.
INCORPORATED

ROI was incorporated in February of 1969 to serve the critical needs of the rapidly expanding computer industry and the increasing number of companies using computer systems and services.

LOCATION

- *Lexington, Massachusetts ROI is conveniently located one mile east of the intersections of Routes 128, 4 and 225, fifteen minutes from downtown Boston via Route 2 or the Massachusetts Turnpike, and ideally situated in the midst of the New England computer community.*

R.O.I. *RESOURCES OBJECTIVES INCORPORATED*

(617) 862-6200 | **1 Militia Drive Lexington, Mass. 02173**

POSITION ANNOUNCEMENTS | POSITION ANNOUNCEMENTS | POSITION ANNOUNCEMENTS | BUY SELL SWAP | BUY SELL SWAP

DIRECTOR DATA PROCESSING

Growing Colorado electronic manufacturing company with revenues in excess of $55 million is seeking seasoned D.P. executive to assume full management responsibility for operations, programming and applications system design. Candidate should be degreed with a minimum of 7 years experience managing full D.P. operation. Heavy exposure with IBM 360/370 O.S. required. (V.S. desirable). Full complement of fringe benefits including relocation allowance, compensation incentives commensurate with experience. Send resume to:

CW Box 4100
797 Washington St.
Newton, Mass. 02160
An Equal Opportunity Employer

EDP PROFESSIONALS
Sydney, Australia

COMPUTER SCIENCES OF AUSTRALIA, PTY., LTD. (CSA), an affiliate of Computer Sciences Corporation, is a rapidly growing, dynamic company of 430 professional staff. CSA is the largest Australian independent software company providing a comprehensive range of facilities management and EDP consulting services, together with a national remote processing network.

Planned development has created immediate requirements for permanent additions to the staff. CSA is seeking EDP specialists for consulting assignments, including the implementation of a large data base real-time network linking minicomputers to a UNIVAC 1110 and a variety of other client assignments involving a range of com puter hardware and design applications.

CSA is specifically interested in hiring

- **Systems Programmers**
- **Sr. Programmer/Analysts**
- **Software Design Analysts**
- **Programmers (PL/1, COBOL, Assembler) and**
- **Marketing Representatives**

with experience in one or more of the following areas:

- 360 Software
- Communications Engineering
- Minicomputer Software
- Data Base Systems Design (DMS 1100)
- Real-time Systems Analysis and Design
- UNIVAC EXEC 8
- Applications Programming
- Multi-Programming On-Line Systems
- Marketing Software Services.

These positions are available to all qualified applicants within the U.S. and Canada and inquiries from Australian citizens interested in returning home will be particularly welcomed. Positions will be offered on the basis of migration to Australia for permanent settlement. A comprehensive fringe benefit package is in effect including four (4) weeks salary salary for three (3) weeks vacation annually; life, disability, medical and dental insurance; immediate pension vesting, and subsidies for relocation expenses.

Interviewing will be conducted in or convenient to your location during the first few weeks in June by CSA Managers. Interested applicatns are urged to submit complete resumes (in confidence) including family status, salary history and availability to reach us by May 24th. Send resume to:

J.F. Niblock
Department CW 510 A

COMPUTER SCIENCES CORPORATION
650 North Sepulveda Boulevard
El Segundo, California 90245

An equal opportunity employer M/F

PROGRAMMER ANALYST

If you have eight years or more of heavy experience in the design, implementation and project management of D.P. Systems for:
- Production and inventory Control
- Standard Cost
- Marketing Analysis and Sales Reporting
- Material Requirements Planning
- General Accounting
- Order Processing, Billing and Credit

this may be the position you have been training for. Requires knowledge of RPG, COBOL, and experience with disc-oriented processing. Must have the ability to take full responsibility for all systems and programming functions, including user interfaces. Experiences with IBM, PICS system is highly desirable. BS-BA desirable. Some college level training is required.

Send resume & requirements to
Weber Dental
P.O. Box 1798, Sta. A
Canton, Ohio 44705
An equal opportunity employer

EDP OPPORTUNITY PROVEN SUCCESS

Completing National expansion program, Company participation. Sales and Service. Joint operation. Our patented equip., know-how, supplies, acctg. and support. Your time, sales effort, field expense.

Write to
Data Processing Support
2445 Chico Ave.
So. El Monte, Calif. 91733
or call Mr. Ford at
(213) 579-5555

PROGRAMMER

An opportunity to join a progressive company with a growing service bureau located in small town. This position offers a splendid opportunity for the right person who doesn't work by a time clock. Liberal benefits including hospital and major medical insurance. All replies confidential. Send complete details to:

CW Box 4097
797 Washington Street
Newton, Mass. 02160

Buy Sell Swap

370-155
FOR SALE
3135 (I) 512K
3274
1433
1434
7855
3360 (03)
3215 (01)
P.C.M. Corp.
2636 Farrington
Dallas, Texas 75207
(214) 637-0950

WANTED HEWLETT PACKARD
2000C' or 2000F
TIMESHARING SYSTEM
Will Purchase, Rent, or Lease
Contact
James L. Walzer
J.P. Computer Systems, Inc.
534 Broad Hollow Rd.
Melville, New York 11746
(516) 420-9400

FOR SALE
SPECTRA 70/45-128K
System Includes:
4 TAPES
2 DISKS
2 PRINTERS
AVAIL 4th QTR 1974
CW Box 4098
797 Washington St.
Newton, Mass. 02160

DATAPOINT 2200
Minicomputer Disk System

16k Computer with Datapoint printer, and Diablo 2.4 mb Disk with 4 packs and Cassette tapes. Maintenance by Datapoint Corp.

Available F.O.B. Ft. Laud. or Attractive Long Term Decreasing Lease.

Call Mr. Bob Ritcey
@ (305) 752-1203 or
evenings (305) 752-4258

WANTED
System 3's
Scrap Tab Cards
FOR SALE
Large quantities IBM equipment
1401-1402
082 sorters
085 collators
402-403 Tabs.
514-519 Reproducers
024-026 Keypunches
056 Verifiers
1620-40K System
Also 1316 Disk Packs
2400 ft. tapes & seals
DEALERS INQUIRIES WELCOME
ARVCO COMPUTER
(617) 987-0185

360-20-D2-16K
COMPLETE TAPE SYSTEM
AVAILABLE MAY 15, 1974
DAC
DATA AUTOMATION CO., INC.
4858 CASH ROAD DALLAS, TEXAS 75247
(214) 637-6570
Member Computer Dealers Assoc

WE WANT TO BUY
MINI COMPUTERS
and Peripherals
WE ALSO SELL THE ABOVE
CALL OR WRITE FOR FREE BROCHURE
NEWMAN COMPUTER EXCHANGE, INC.
3960 Varsity Drive
Ann Arbor, Mich. 48104
(313) 973-1230

FOR SALE
CDC 3300
System & Units
6638, 854 Discs

H/W 120
16K 3 Tape System

UNIVAC 9300
16K, 4 Tape System
24K, 8414 System

GIBBS Enterprise, Inc. Box A Hingham Mass., 02043 (617) 749-7691

WANTED
BURROUGHS L SERIES
TC 500, A149, A150
NCR 31, 32, 41, 42
481-482
FRIDEN Computypers and Flexowriters
IBM 735 I/O Terminals
Call Stuart Rubenstein
I.O.A. Data Corp.
383 Lafayette St., N.Y. 10003
(212) 673-9300
Member Computer Dealers Assoc.

360/20's
Available Now
16K D2, 1403-2 – You design I/O 8K C2, 2203, 2501 & Bi-Synch
- Lowest Cost 360 - 8K C3, 2203, 2560 A Component or Complete System Specialists in 360/20

CMI Corporation
16225 E. Warren Ave.
Detroit, Michigan 48224
(313) 889-0440
Member Computer Dealers Association

RARE PLOTTERS UP FOR SALE
Calcomp 563 Plotters are rare indeed, but we have uncovered several in prime condition.

We can deliver .005 & .010 step sizes, new & rebuilt, immediately; sale or lease, with warranty. Tape drives also available.

CALL AVS 213/598-3318
"The Plotter Specialist"
Automated Visual Systems
12062 Valley View Street
Garden Grove, CA. 92645

Want to buy
a used
EAI-680 analog computer
minimum 2/3 expanded.
Contact G.H. Kent
Sundstrand Aviation
Rockford, Ill.
(815) 226-6768

TI 980A COMPUTER
16K memory, diablo disc, Silent 700, card reader, timer, all interfaces and full software.. 6 months old. $18,500 or lease at appx. $425. Also RCA 12" CRT, $700; 3" CRT, $400; new CDS floppy disc, $600; several Vadic modems.

Joe M. Wiley
7403 Geneva Drive
Austin, Texas 78723
(512) 926-7610

360-370 marketplace
BUY • SELL • LEASE

BRANCH OFFICE:
222 E. Wisconsin Ave.
Lake Forest, Ill. 60045
(312) 295-2030

TLW
COMPUTER INDUSTRIES
INCORPORATED

BRANCH OFFICE:
3031 Tisch Way
Executive Suite 13
San Jose, Calif. 95128
(408) 249-0110

3570 AMERICAN DRIVE • ATLANTA, GEORGIA 30341 • 404/451-1895

BUY SELL SWAP | BUY SELL SWAP | BUY SELL SWAP | BUY SELL SWAP | BUY SELL SWAP

Univac 111 Components

FOR SALE

Excellent Condition

Uniservo 111s (each)	$1500.
High Speed Printer	5000.
8K Core Memory	2500.

Other Items such as Synchronizer — Index Registers- Power Supply Etc. Available

Parity Systems Leasing Corporation

900 Walt Whitman Road
Melville, N.Y. 11746
(516) 427-8900

FOR SALE
NCR CENTURY-200
AVAILABLE JUNE, 1974
32K CPU, I/O WRITER
1500 LPM PRINTER
300 CPM CARD READER
1500 CPS PPT READER
655 DUAL DISK
20 DISC PACKS
CONTACT GENE McMENAMY
COMPUTER SYSTEMS
GRANTS PASS, OREGON
(503) 476-6557

SALE

IBM 729 Model M2's

Bargain Priced
Trades Accepted

EBM 220 Harvest Ave. Staten Is. N.Y. 10310 (212) 273-3636

WANTED!!
(To Purchase)

CDC 915 Scanner
9 Tr. 800BPI Tape Dr.
& Controller
8092 Processor
teletype
BOX 1444
MARYLAND HEIGHTS,
MO 63043

---

don't LEASE!

UNTIL YOU FIND OUT WHY LEASING FROM THE FULL-SERVICE COMPANY IS DIFFERENT....

NOW AVAILABLE:
(2) 360/40H WITH I/O SET
AND
360/50 I WITH I/O SET

CALL STEVE ELIAS AT (213) 678 0311
OR WRITE TO

CSC
COMPUTER SCIENCES CORPORATION
650 N. SEPULVEDA BLVD
LOS ANGELES, CALIFORNIA 90245
Major Offices and Facilities Throughout the World

Xerox Sigma 5 32K,

Completely refurbished

RCA Spectra 70/45

Systems Available Immediately

Call or write
John Fermanis
Comdisco, Inc.
2200 E. Devon Ave.
Des Plaines, Ill. 60018
(312) 297-3640

OS/VS1 VSAM INTERFACE

For the Cobol user who desires to move up to native VSAM now.

- Provides full keyed VSAM facilities to the Cobol programmer
- Full native VSAM without ISAM interface restrictions
- Dynamic sequential/direct access switching
- Full Setl Esetl (point) capability
- Full and generic key processing
- Allows record insertion in sequential update mode
- Easy to learn and use

GSI, INC.
BUD McCOMB
602-957-9040
Call or Write:
P.O. Box 16201
Phoenix, Arizona 85011

FOR SALE
IBM 3345-1

(128 K of
core for 370/145

IBM 3803 and 3420 tape drives.

Systems Marketing, Inc.
Del Webb Townhouse
100 W. Clarendon
Phoenix, Ariz. 85012
(602) 248-0457

WANTED

TELETYPE® EQUIPMENT
New • Used • Parts
— ALSO —
• Data Terminals • Peripherals
• Mini-Computers • Modems

Contact us for data terminal sales, service, supplies and rentals.

TERMINAL SYSTEMS INC.

11300 Hartland St.
N. Hollywood, Calif. 91605
213-769-6772 TWX 910-499-2675

FOR SALE OR LEASE

024-$350; 026-$1300; 056-$250;
077-$550; 082-$900; 083-$2300;
085-$1500; 088-$3300; 402-$1300;
403-$1400; 407-$3000; 514-$900;
519-$1500; 548-$2000; 552-$1400;
557-$3700; 602-$400;
2311 (1)-$3300; 729 (4)-$2000;
729 (5)-$2500; 729 (6)-$2000;
1401 System-$14,000

Member
Computer Dealers Association
THOMAS COMPUTER CORP.
600 North McClurg Court
Chicago, Illinois 60611
(312) 944-1401

CANADA

360/40
Ready to Ship
Low Cost

CMI Company
408 Bartlet Building
76 University Ave. W.
Windsor, Ontario N9A 5N7
(519) 258-8910
Member Computer Dealers Association

Shop the CLC computer supermarket

SALE... LEASE... PURCHASE... TRADE

THIS WEEK'S SPECIAL:
UNIVAC 1108
Complete systems with all peripherals

Call your nearest CLC office:

Washington (703) 521-2900	St. Louis (314) 878-4741	Dallas (214) 637-5010
Pittsburgh (412) 921-3077	Kansas City (816) 471-7376	Los Angeles (714) 645-3712
Atlanta (404) 393-1309	Houston (713) 447-0325	San Francisco (415) 928-7202
Chicago (312) 298-0888		Portland (503) 297-4721

CLC Computer Leasing COMPANY

Hq: 2001 Jefferson Davis Highway, Arlington, Va. 22202
Member: Computer Lessors Association

BUY • SELL • LEASE
IBM 360/370

360/65, 512K IBM core, 2880-equivalent block multiplexor channel, eight 3330-type OEM discs, two selector channels, multiplexor channel, I/O set, six 120KB, 1600-BPI tapes and controller available at $19,750 per month on long-term lease. Other configurations to your specifications.

370/155JI, 4 block multiplexor, 2 byte multiplexor, many other features. May delivery.

IPS
IPS COMPUTER MARKETING CORP.
467 Sylvan Avenue,
Englewood Cliffs,
New Jersey 07632
(201) 871-4200,
TWX (710) 991-9677
"MEMBER COMPUTER DEALERS ASSOCIATION"

WHEN BUYING OR SELLING GO GREYHOUND

FOR SALE
360/30's, 360/40, and 360/50
Special - System 3 Model 10
Avail Now — 2314-1's

WANTED
All 370's, 360/65's and 360/50's

GREYHOUND COMPUTER CORP.

Home Office
Director of Equipment Sales
Greyhound Tower
Phoenix, Arizona 85077
(602) 248-5978

Dallas Office
M. Wm. (Bill) Tucker, Jr.
Equipment Sales Manager
7540 LBJ Freeway
Dallas, Texas 75240
(214) 233-1818

BUY•SELL RECONDITION

New or Used
TELETYPE® MACHINES
&
DATA COM EQUIPMENT

call or write:
(214) 252-7502
TWX 910-860-5761

vardon & associates, inc.
930 N. Beltline, Suite 140
Irving, Texas 75061

IBM UNIT RECORD EQUIPMENT — IBM COMPUTERS
Big Savings — up to 50% on Short Term Rentals

AVAILABILITIES

024	083	402	523	We Buy, Sell or Lease
026	084	403	548	360 - 20
029	085	407	552	
056	087	408	557	System 3
077	088	514	602	1130
082	089	519	604	

Call us for all your needs, we buy, rent and sell all types of IBM unit record equipment. Over 12 years of serving commercial and government requirements. All equipment rebuilt at our own factory and guaranteed for IBM MAINTENANCE. Contact: John Fennell V.P. for proposal. 212-689-4747
Cable: Leasatrón, New York Telex: 423857 LMC U1
LMC Data, Inc. 116 East 27th Street New York, New York 10016

BUY SELL LEASE

All model 360/20's, 360/30's, 40's, 50's, and 65's. 370's and System 3's. All peripherals and unit record equipment.
IBM 1401 SYSTEMS

DAO
DATA AUTOMATION CO., INC.
4858 CASH ROAD DALLAS,
TEXAS 75247
(214) 637-6570
Member Computer Dealers Assoc

FOR SALE
XEROX
7242 DISC SYSTEM

Including controller, Ext. width interface, 2 dual spindle disc units and disc packs.

Call or Write:
Bucknell University
Computing Center
Lewisburg, Pa. 17837
(717) 524-1436
Ask For: B.D. Gay or Jon Eschinger

For Sale
By Owner
Immediate Delivery
DEC
(2) TU10 TAPE DRIVES & CONTROLLER
R.L. Ruberton
Typgraphic Service Inc.
1027 Arch Street
Philadelphia, Pa. 19107
(215) 923-9000

WANTED
ALL 360 SYSTEMS

360/30 1401 1440 2311 360/25 360/20 360/40

CORPORATE COMPUTERS, INC.
115 Mason St., Greenwich, Conn. 06830 (203) 661-1500
Member Computer Dealers Association

360/65 STORAGE UNIT
FOR SALE OR LEASE
512K ITEL/AMS

Available July 1, 1974
Any Reasonable Offer
Will Be Considered
CW Box 4101
797 Washington St.
Newton, Mass. 02160

TOP CASH PRICES FOR:
IBM 059 VERIFIERS
IBM 029,
026 KEY PUNCHES

Also, 526, 047, 188 IBM Unit Record Machines, IBM 1401 Computer System, 12 or 16K w/multiply & divide feature, 1402 & 1403 (must have disc adapter). Phone Collect:
(313) 584-4300
MICHIGAN SYSTEMS RESEARCH COMPANY
6661 Schaefer Road
Dearborn, Mich. 48126

BUY SELL SWAP | BUY SELL SWAP | BUY SELL SWAP | BUY SELL SWAP | BUY SELL SWAP

SYSTEM 360/370 | dearborn computer leasing corporation

A business relationship you can't afford to be without . . .

- Lease Terms to Fit Your Needs
- Field Engineering Support
- Systems Engineering Support
- Well Trained Marketing Staff
- Buy and Sell 360s
- Subleasing
- Member, Computer Lessors Association

Dearborn Computer Leasing Corporation
a subsidiary of Dearborn-Storm
4849 North Scott Street / Schiller Park, Illinois 60176 Area 312 / 671-4410

CONTROL DATA
CDC 3300 MASTER SYSTEM

Ideal for Educational Institutions — Hospitals — Scientific environments — with Business Data Processing.

CDC Peripherals
Additional Memory

Short term lease or sale on extremely Attractive Terms.
Guaranteed Trade In or Upgrade to IBM 370 Syste....

Computer Systems of America, Inc.
141 Milk Street, Boston, Mass. 02109
(617) 482-4671

SALE-LEASE-TRADE

SIX 2740-1's Communication Terminal with F/C 4790

SIX 2816-1's Switching Unit, most with F/C 1050, 1051, 1052, 1055, 2285, 4455, 6392, 7803

ONE 2702 Transmission Control with F/C 4613, 4615, 4634 and Seventeen 3233's

ONE 1053 Printer

TWO 2701-1 Data Adapter Units, F/C 3815, three 3855's, four 4636's, four 4645's

TWO 1925-18 Interface Switch

ONE 2973-2 Storage Unit Switch

ELEVEN RCA 3484 - 7 Tk Tape Drives, 800 B.P.I., 30 KB

TWO Univac 1004 System Uni-Servo Master Md. 7915-02

If you are interested, please call

William Mazur at (914) 592-3100

Randolph... your neighborhood computer leasing company.

With offices in thirteen cities, Randolph backs up their IBM S/360 and IBM S/370 leases promptly with unique customer support services. For details, call Randolph . . . your neighborhood computer leasing company.

Northeast:
537 Steamboat Road
Greenwich, CT 06830
(203) 661-4200
(212) 931-1177

Box 1963
100 Federal Street
Boston, MA 02105
(617) 434-4043

621 Country Club Road
Avon, CT 06001
(203) 673-0435

20 Cornell Place
Englishtown, NJ 07726
(201) 446-6300

Mideast:
6110 Executive Blvd.
Rockville, MD 20852
(301) 770-6266

Southeast:
260 Peachtree St. NW
Atlanta, GA 30303
(404) 688-6932

Midwest:
8050 Hosbrook Rd.
Cincinnati, OH 45236
(513) 793-6060

625 North Michigan Ave.
Chicago, IL 60611
(312) 787-4224

Southwest:
1545 W Mockingbird Lane
Dallas, TX 75235
(214) 637-3680

6440 Hillcroft, Suite 108
Houston, TX 77036
(713) 666-9464

West:
One Wilshire Blvd.
Los Angeles, CA 90017
(213) 680-9195

525 University Ave.
Palo Alto, CA 94301
(415) 327-2780

530 "B" Street
San Diego, CA 92101
(714) 232-6401

RANDOLPH COMPUTER COMPANY
Division of Firstbank Financial Corporation
A subsidiary of the First National Bank of Boston

FOR SALE
Bridge Data Card Reader Model 8063

Reads 80 Column Cards at 500 per Minute. Attachable to an IBM System 3 Model 6.

Immediate Delivery

Call: G. Samet
(212) 524-5472
Write
Interstate Dress Carriers
247 West 35th Street
New York, N.Y. 10001

20 cabinets/20 drawers
IBM 80 column card cabinets
Excellent condition

Current Inventory

SALE

All this Unit Record Equipment in stock and ready to ship at money saving sale or lease prices.

RARELY OFFERED

046, 047, 029, 059, 407, A3, 548, 557, 087, 088
MARK SENSE 519
OTHER FINE MODELS
024, 026, 056, 077, 085, 402, 403, 407, 514, 519, 523, 552, 602, 604, 521, 826

Member Computer Dealers Assoc.

D.P. Equipment Marketing Corp.
260 W. Broadway, N.Y. N.Y.
(212) 925-7737 Ext. 1

we buy and sell

IBM Unit Record Machines
IBM 735 I/O Terminals
NCR 31 - 32 - 33 - 395 - 400, NCR 480 - 481 - 482 - 450
BURROUGHS - L - SERIES

marion
84 Kennedy St. Hackensack, N.J. 07601 (201) 343-4554

1600 Broadway
New York, New York 10019
(212) 541-6340

029 029 026 026

Buy·Sell
LEASE
IBM 360/20

SIMPLICITY COMPUTER

360/370
BUY-SELL-LEASE

Call or Write:
George S. McLaughlin
Associates, Inc.
480 Morris Avenue
Summit, N.J. 07901
(201) 273-5700
Member Computer Dealers Association

FOR SALE
2501-B1
Card Reader
Immediate Availability

SALE or LEASE
360/20
MOD. D2 16K
2560-MFCM, 2203 printer
2-2311 Disk Drives
Avail. July 1, '74

I.O.A. Data Corp.
383 Lafayette St.
New York, NY 10003
(212) 673-9300
Member Computer Dealers Assoc.

LDI

SPECIALISTS IN 370 CORE 3360/003 3360/005

BUY • SELL TRADE • LEASE ANY EDP EQUIPMENT

Leasing Dynamics Inc.
3101 Euclid Ave.
Cleveland, Ohio
216-687-0100

MOHAWK DATA SCIENCES
1101 DATA RECORDERS
AND
1102 TAPE POOLERS

FOR SALE

Excellent Condition
Certified for Maintenance
Low Low Price

Write to P.O. Box 37
Jericho, N.Y. 11753

FOR SALE

S.C.M. TYPETRONIC
98/330 (CDC-9816)
2R/2P WITH FRONT FEED CARRIAGE

INCLUDES control unit. I/O printer, processor, two readers and two V-punch units. Original cost $23,000.00. Best offer.

Owner, Mr. Hepburn
Rockland
(617) 871-1790

SALE OR LEASE

360 Systems, 1401 Systems
2400 Tape Drives, 2311 Disk Drives
1620 Systems, 029, 206, 059
All Types Unit Record Equip. Incl. 082, 083, 402, 407, 514, 519, 557

EQUIP. WANTED

360 Systems, 1401 Systems
Tape Drives
All Types Of
Card Equipment
029, 059, 026

SPECIAL SALE

360 (30) Sys. I,O, Set	1620 Disk Sys.	1401-8K
	1443 Printer	729-Tapes
	2311 Disk Drives	

dpa

- **DPA with offices in most major cities now offers IBM equipment completely reconditioned prior to shipment.**
- **Member Computer Lessors Assn.**
- **Call or Write**

DPA Inc. 2636 Farrington St., Dallas, Texas 75107 (214) 637-0950

FOR SUB-LEASE
IBM 360/65
Available July 74

We currently have a 360/65 and are anxious to sub-lease. We will pass on all benefits to leasee.

Write CW Box 4096
797 Washington Street
Newton, Mass. 02160

Details:
(1) 360/65 at 1 Meg.
(1) Multiplex channel
(3) Selector channels
(3) Sub-selector channels
(1) Console typewriter

Terms:
We currently have 2 years remaining on a contract. We will contract for:
— 2 yrs. firm
— more than 2 years
— 2 years with a penalty out after 1 year
— (penalty is 4 months rent decreasing by 1/12 for each month installed over 1 year.)
Purchase will be discussed.

1401

Several Systems Available With or Without Tape Drives

CMI Corporation
16225 E. Wareen Ave.
Detroit, Michigan 48224
(313) 889-0440
Member Computer Dealers Assocation

BUY...SELL...LEASE
IBM 360/370

THE COMPUTER EXCHANGE INC.
Member. Computer Dealers Association

In the West: 235 Montgomery Street, San Francisco, CA 94104, (415) 788-0600. In the East: 11 Grace Ave., Great Neck, N.Y. 11021, (516) 466-6500.

FORSYTHE McARTHUR ASSOCIATES INC

SALE OR LEASE

IBM 3330 Disk System — 8 Spindles & Control
IBM 2314/A1 Disk System — 5 or 7 Spindles & Control
IBM 360/30 and 360/40 Computers

• 919 North Michigan Avenue • Chicago, Illinois 60611 •
Telephone: (312) 943-3770 • Telex 255161 (CAPMARKCO • CGO)
Member, Computer Dealers Association

LEASE BUY SELL

DEAL WITH PROFESSIONALS IN PLACEMENT OF

PRE-OWNED **360/370** EQUIPMENT

"The Nations Largest Wholesale Dealer"
Member Computer Dealers Association

COMPUTER WHOLESALE CORP.

SUITE 441-447 NATIONAL BANK OF COMMERCE (504) 581-7741
NEW ORLEANS, LA. 70112

BUY SELL SWAP | BUY SELL SWAP | BUY SELL SWAP | BUY SELL SWAP | BUY SELL SWAP

buy lease **360/370** sell trade

ATTENTION!!

SPECIAL PACKAGE PRICE

360/25 CPU, 3-2311s, 1403 Printer
1442 Card Read Punch & 2415 Tape

ALSO: 360/40 Core Available
64-128K or 192-256K Increments
For Immediate Delivery at Lowest Prices Ever

Call Collect. 612-546-4422

dataserv equipment inc.
400 shelard plaza o suite 415
minneapolis, mn 55426
Member, Computer Dealers Assoc.

1403—N1
PRINTERS
AVAILABLE AUGUST

DAC

DATA AUTOMATION CO., INC.
4858 CASH ROAD DALLAS,
TEXAS 75247
(214) 637-6570
Member Computer Dealers Assoc

G.E.
N.C.R.
R.C.A.
UNIVAC
HONEYWELL

Many Think of Us
As a Quality IBM
Dealer — We Are!
But, Don't Overlook
Our Reputation In
Non-IBM Equipment.
Put Us To Work
For You . . . . . .
Buying, Selling, Leasing
CONTACT:
Gary Johnston, Lee Johnston or
Gary Zywotko
TELEX 98-5596

American Computer Exchange
29525 Chagrin Blvd.
Pepper Pike, Ohio 44122
(216) 464-3881
Member Computer Dealers Assoc.

FOR SALE OR LEASE
IBM
1401 SYSTEMS
with or without
Tape Drives & Disks
Savings in thousands
Member
Computer Dealers Assoc.

D.P. Equipment Marketing Corp.
260 W. Broadway, N.Y. N.Y.
CALL (212) 925-7737 Ext. 1

---

360 Model 30
AVAILABLE FOR
IMMEDIATE LEASE
Any core size, CPU only or
complete system including I/O set
For an immediate quote call
Sid Whiting
Director of Computer Marketing
(617) 266-4950
Bankers Leasing Corporation
1255 Boylston Street
Boston, Mass. 02215
Subsidiary of Southern
Pacific Company

1440
12K or 16K CPU
Will Trade for 8K CPU
Also Have Extra Peripherals
Including 7335 Tape Available
CMI Corporation
16225 E. Warren Ave.
Detroit, Michigan 48224
(313) 889-0440
Member Computer Dealers Association

SYSTEMS 70
INCORPORATED
DATA PROCESSING EQUIPMENT SPECIALISTS

2200 E. Devon Avenue
Des Plaines, Ill. 60018
(312) 827-8135

360/370

SYSTEMS 70
INCORPORATED
DATA PROCESSING EQUIPMENT SPECIALISTS

BUY SELL LEASE TRADE

Available Now
360/40, 384K
360/30, 96K all IBM core
360/65, any configuration
360/50, 384K, 3 channels
370/155, with or without core
I/O sets available

Wanted to Purchase
370/145
2314-1 DASF
1419 MICR reader
All 1600 BPI tape drives

COMDISCO
2200 E. Devon Ave., Des Plaines, Ill. 60018 • Ph. 312-297-3640 • TWX 910-233-2478

BUY-SELL-LEASE
360/20

360
30/40/50
65

370
145/155

1130

ECONOCOM
Subsidiary of Cook Industries Inc.
855 Ridge Lake Blvd.
P.O. Box 171116
Memphis, Tennessee 38117
(901) 767-9130
"MEMBER COMPUTER DEALERS ASSOCIATION"

Who took *all* the gamble out of buying & selling used computers?

Comdisco. Biggest dealer in the world.
The one who has already bought & sold more used 360's & 370's than anybody else.

We're the one who thinks nothing is too small or too big to handle — be it a tape or disc drive, or a complete 370 system. The one who offers the same professional expertise to all DP users, big and small. The one who handles it all from start to finish, including transportation, installation, etc., for you and your foreign subsidiaries. The one who warns you not to buy good intentions, but real hardware that's available now and maintainable by IBM when you get it. The one who tells you where the equipment is, who owned it, what its serial number is and when you can inspect it. The financially stable one who's here today and here tomorrow. **Our idea:** Give every transaction and customer, big and small, the same expeditious treatment. **The result:** It paid off for users and for us. Hundreds of firms have saved millions and we're now No. 1 in buying, selling, leasing, trading used IBM equipment. Thus we're able to draw on the experience of many users and their cost-saving methods. Like using used 360's to do the same job as new 370's. Often the biggest difference is price! Write for more information, cost-saving data and our annual report. **For instant action call us collect anytime. Our phone: 312-297-3640. Our TWX number: 910-233-2478.**

Available from Comdisco:

SALE, LEASE, TRADE — 370's: 370/155 available immediately, 370/135 available April.

SALE, LEASE, TRADE — 360's: Special on 360/40 CPU's — lease or sale all models in inventory from 64K to 384K. Special on all IBM 40 core, all increments to 384K. 360/50 available now, 360/30 96K all IBM core, 360/65 sale or lease.

SALE, LEASE — OTHER, 2314 model 1 or A1, 3 to 9 spindles, 2365-2 core, 3360-3, 2420-7 tape drives, I/O sets available.

WANTED TO PURCHASE OR TRADE: 370/145 — 256K model 1.

COMDISCO
2200 E. Devon, Des Plaines, Illinois 60018

Member Computer Dealers Assoc.

BUY SELL SWAP | BUY SELL SWAP | BUY SELL SWAP | BUY SELL SWAP

We Need:
360/40-256K
2821 MOD 1
32K-2 MIC CORE

BUY
SELL
LEASE

FOR
BETTER
VALUE
LOOK TO:

Available:
1412 with 360 adaptor
1412 with 1401 adaptor
(Avail. 60 Days)

cac COMPUTER ACQUISITIONS COMPANY
P.O. Box 80572 Atlanta, Ga. 30341 (404) 458-4425

New! **1401 SIMULATOR**
"SIM14"
NOW AVAILABLE FOR 360-50-65 USERS

- EXECUTES UNDER BOTH DOS & OS
- SUPPORTS 1401 UNIT RECORD, TAPE AND DISC DEVICES
- JCL AND FILE COMPATIBLE WITH CS30-40
- SELF RELOCATING FOR MULTIPLE PARTITION EXECUTION
- THRUPUT SPEEDS EQUAL TO CS40
- PROVEN PRODUCT BY CUSTOMER USE
- TAKE ADVANTAGE OF 360-50-65 LEASE PRICES WITHOUT HAVING TO REPROGRAM **ANY** 1401 PROGRAMS

Call or Write
DEARBORN COMPUTER LEASING CORPORATION
Subsidiary of Dearborn-Storm Corporation
4849 No. SCOTT, SCHILLER PARK, ILLINOIS 60176 312 671-4410

Attention 360 & 370 Users

We Have Only (4) 2303-1 Drum Storage and (3) 2841-1 (W/Drum Storage Attachment) Left in Inventory

FOR DETAILS CONTACT:

Dave Riggs (212) 572-6905
or
Chuck Gibney (212) 572-6917
C.I.T. Leasing Corporation
650 Madison Avenue
New York, New York 10022

Here's the word from ITEL about buying or selling a used IBM 370.

If you're buying, ITEL can provide the exact configuration you want—when you want it. (And we won't just quote you a price. We'll quote you a serial number, too.) If you're selling, we're ready with cash. Either way, call the Computer Sales Corporation at ITEL.

Dick Hynes at (415) 983-0278,
Rick Becker at (415) 983-0260, or
Fred Hegeman at (415) 983-0410.

145, 155, 3360's, 360-50
360-65, 2314's Available
135's 145's, 155's and 165's required

ITEL CORPORATION

One Embarcadero Center San Francisco, California 94111 Phone (415) 983-0000

CROSS buys, sells and leases all
360's 370's
360/20, 30, 40, 50 and 65's
370/135's, 145's and 155's
SYSTEM/3
UNIT RECORD EQUIPMENT
ALL PERIPHERAL DEVICES
LEASE FINANCING AVAILABLE
(516) 487-9812
CROSS COMPUTER CORPORATION
505 Northern Blvd. Great Neck N.Y. 11021
TELEX 12028
MEMBER COMPUTER DEALERS ASSOCIATION

WANTED
Card Punches
and
Interpreters
R.K. Enterprises
(203) 438-9567

---

360 Model 40
AVAILABLE FOR IMMEDIATE LEASE
Any core size, CPU only or complete system including I/O set
For an immediate quote call
Sid Whiting
Director of Computer Marketing
(617) 266-4950
Bankers Leasing Corporation
1255 Boylston Street
Boston, Mass. 02215
Subsidiary of Southern Pacific Company

Before You Buy — Lease
Sell — 360, 370, 1401
IBM Unit Record Equip.
Please Call or Write
COMPUTER CLEARING CORPORATION
5025 N. Central Expressway
Suite 3046 Dallas, Texas 75205
Telephone (214) 528-5087
18 Years Experience, and--
"We guarantee delivery at a fair market price."
George Jachimiec, President

FOR SALE OR LEASE
IBM 1410
COMPLETE TAPE AND DISK SYSTEM
BARGAIN PRICED
Member Computer Dealers Assoc.
D.P. Equipment Marketing Corp.
260 W. Broadway, N.Y. N.Y.
CALL (212) 925-7737 Ext. 1

FOR SALE
Immediate Delivery
DEC
PDP 8L's 4K Memory
PDP 8M's 4K Memory
Phone 301-296-0094
Donald E. Grempler
Realty Inc.

SELL OR LEASE
NCR-200 64K
Complete System
Univac-0758-00 printer
The Computer Place
7670 Chippewa Road
Brecksville, Ohio 44141
(216) 526-2080
A Division of D&D Financial Enterprises Inc

OPEN TO BUY MINIS
DEC-HONEYWELL
Data General
HP-SEL-IBM
Varian Interdata
etc . . .
Available Cash
Large Lots Preferred
(617)261-1100
AMERICAN USED COMPUTER CORP.
P.O. Box 68, Kenmore Station
Boston, Mass. 02215
TWX: 710-321-6388
member
COMPUTER DEALERS ASSOCIATION

WANTED
IBM 1419
Principals Only
Box 41006
Brecksville, OH 44141

---

083 SORTERS
COMPLETELY REFURBISHED
UNDER IBM MA
AVAILABLE IMMEDIATELY
DAC
DATA AUTOMATION CO., INC.
4858 CASH ROAD DALLAS, TEXAS 75247
(214) 637-6570
Member Computer Dealers Assoc

FOR SALE
BY OWNER
60 — NCR 655 Disk Packs
Available in Augst, 74
1 — NCR 735-531
2 — NCR 735-101
and
1 — Moore Detacher — 400
with imprinting unit
Contact Mr. Kobayashi
City of Grand Junction
Computer Center
P.O. Box 968
Grand Jct., Colo. 81501
(303) 243-2633 Ext. 59

ACS
ATTENTION!!
1440 USERS
7335-II TAPES
1403-2 PRINTER
1446-1 CONTROL
AVAILABLE NOW
1401 SYSTEMS
360 SYSTEMS
U/R EQUIPMENT
Member Computer Dealers Assoc
ACS Equipment Corporation
8928 Spring Branch Drive
Houston, Tx 77055
(713) 461 1333

Time for Sale

NEW JERSEY

I.B.M. - 360-30
All shifts available
65K, 5 - 2401 Mod-2 9 track
2 - 2401 Mod-2 7 track
4 - 2311, 1403-N1, 2540
Prices start at $35.00 per hour.
We also offer complete processing services. Configuration can be modified to accommodate any 360 computer user. We have on-site CE's.
UCS Computer Centers
Route 80
Dover, N.J. 07885
Contact Bill Kersey at
(201) 361-8600 or
Sam Amoresano at
(201) 361-8601

ILLINOIS

IBM 360/370 USERS
Computer Time Available
370/158
2 meg, 3 3330 (32m), 3 2314 (24m) 12 3420-5 tape, 2 1403, 3211.
OS/VS2, RJE, IMS, TSO, DOS emul.
24 Hours — 7 Days
CAN YOU BEAT
8.7 cent/sec for a 64K region?
370/155
2 meg, 3330 (8m), 2314 (8m), 10 3420-5 tape.
370/135
240K, 4 3330's 1 2314, 6 3420-5 Tape.
360/30
64K 5 3420-3dd Tape, 4 2311's.
For Further Information
CALL RON ELLIS
(312) 346-1331
computer research company
200 N. Michigan Avenue
Chicago, Ill. 60601
Largest Computer Time Sales Co.

MASSACHUSETTS

WALTHAM, MASSACHUSETTS
PDP-11
RK-05, DECtape,
DECwriter, Paper Tape,
16K Words Core
$25/Hour
Call (617) 492-6520 — TMI

SYSTEMATIC DATA PROCESSING SERVICES, INC.
IBM 370/155
DATA CENTER
Batch Computer Time
Remote Job Entry
Interactive Systems
— WYLBUR —
CCA 204 Data Base Mgmt. System
Remote Terminal located in Harvard Square at PSDI, 14 Story Street, 5th Floor. Easily Accessible Via MBTA.
Call Sales Dept. (617) 890-1200
400 Totten Pond Road
Waltham, Mass. 02154

TIME FOR SALE

MASSACHUSETTS

COMPUTER TIME
BROOKLINE

370/135

1st and 2nd Shift
96K DOS or DOS/VS
Power 2

5-3330 1-2501
2-3420 1-1442
1-1403

$50.00 per hour
Contact: Mr. K. Coleman
(617) 738-6410

Remote Batch!
Interactive Processing!
Local Batch!

Machine Time From New England's Only FULL SERVICE Data Center

- 24 hours/day, 7 days/week
- IBM S/370/158, S/360/65
- OS/MVT, RJE/HASP
- CICS
- WYLBUR Interactive Batch
- 3330-Compatible Storage
- 3211-High Speed Printers
- Economical Rates, Reliable Service

What more could you ask?

Contact: J. Keith Lehto at 1-851-4111, Tewksbury, Massachusetts.

WANG COMPUTER SERVICES

CW/58

NEW YORK

COMPUTER TIME
ALL SYSTEMS

Special 360-30
Midtown Location
From $25 per hour
The Service Bureau that gives a damn!
ANCHOR SYSTEMS, INC.
(516) 785-1788 (24 Hours)
(212) 697-4660

Thomas National, Inc.

1775 Broadway, N.Y.C.

370/158
DATACENTER

OS-VS — RJE
And Other Communications
Turnkey Responsibilities
DOS Emulation
3330's and 2314's
Systems and Programming Support
Data Entry Services
Convenient 57th St. Location
Open 24 Hours Per Day
Call (212) 765-8500

TIME FOR SALE

VIRGINIA

IBM-370/158
Litton SYSTEM

VS2 - HASP - TSO

DOS EMULATION
2-HOURS GUARANTEED TURNAROUND
ALL SYSTEMS AVAILABLE 24-HOURS PER DAY
LITTON RESTON COMPUTER CENTER
1831 Michael Faraday Drive
Reston, VA 22090
703 471-9200

OHIO

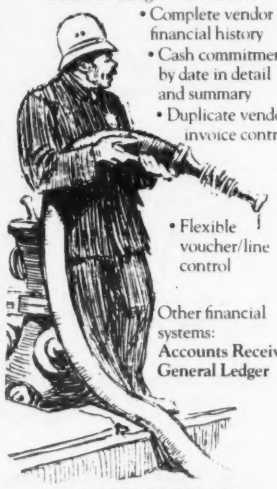
370 — 145
COMPUTER TIME FOR SALE

Available 2nd Shift & Weekends
256K, (4) 3330-type Disk Drives, (2) 2401-type Tape Drives — 800 & 1600 BPI, 1100 LPM Printer Multiplex & Block MPX Channels, 2nd Selector Channel, Word Buffer, Extended Precision Floating Point. DOS and Power.
CONTACT:
W.F. Gortemiller (513) 367-7668
CINCINNATI
CINCINNATI INCORPORATED
Kilby Road, Cincinnati, Ohio

Software for Sale

MMS
Accounts Payable-II
Keeps The Well From Going Dry!

Exclusive features:
- Data base design — all COBOL
- Complete vendor financial history
- Cash commitments by date in detail and summary
- Duplicate vendor invoice control
- Flexible voucher/line control
- Other financial systems: Accounts Receivable General Ledger



SOFTWARE INTERNATIONAL
Elm Square, Andover, Mass. 01810
(617) 475-5040

PAYROLL PERSONNEL
xxx
ACCOUNTS PAYABLE
xxx
Modular, flexible systems with multi-company capabilities. Presently functioning for a variety of users. All programs written in COBOL.
ARGONAUT INFORMATION SYSTEMS, INC.
2140 Shattuck Ave. #203
Berkeley, CA. 94704
(415) 845-7991

SOFTWARE FOR SALE

AUTOCODER & SPS TRANSLATED AUTOMATICALLY to BAL & PL/1

THE **TOTALTRAN** SYSTEM

... The most economical, practical and quickest method of converting to the 3rd and 4th generation.

3 SERVICES OFFERED:
1. 1400 Object to clean source decompilation
2. 1400 Clean source to BAL translation
3. 1400 Clean source to PL/1 translation

Contact: W. Small, President

CPU MANAGEMENT ADVISORY CORP.
853 Broadway, N.Y. 10003
(212) 777-7722

cdi LETTER WRITER

- FOR IBM 360 OR 370
- UPPER/LOWER CASE
- LETTERS (1, 2 OR MORE UP)
- LABELS AND OTHER DOCUMENTS

Easy to program (Cobol Subset) completely versatile — multiple full letter and multiple text variations based on master file data.

Currently used by major companies coast-to-coast including several high-volume direct mail installations.

WRITE OR CALL COLLECT:
(415) 635-5800
S. MARTIN
COMPUTER DYNAMICS, INC.
100 HEGENBERGER ROAD
OAKLAND, CALIFORNIA 94621

QUERY3

COMPUTING's PREMIER INQUIRY SYSTEM

QUERY3

Simple English Language
Writes Multiple Reports
Powerful Selectivity
Full Computation Capability
Can Produce Output Files
Multiple Input File Option
Table Look-Up
File Security
Blue Ribbon User's List
Runs on Most Computers

AZREX
AZREX INC.
215 Middlesex Turnpike
Burlington, Mass. 01803
(617) 272-8750

GERMAN SOFTWARE-HOUSE

is looking for a U.S.-partner, who can deliver commercial operating-system-software, COBOL, PL-1 and RPG II compilers, sort/merge etc. for

DEC PDP-11 and 8 computer systems

to be distributed to end-users in Europe.

INFORMATIK-INSTITUT
6078 Neu-Isenburg 2
West Germany
Postfach 2183
Tel: 0611-6604290

SOFTWARE FOR SALE

ACCOUNTING SYSTEMS

PAYROLL
GENERAL LEDGER
ACCOUNTS PAYABLE
INVENTORY
ACCOUNTS RECEIVABLE

IBM SYSTEM 3 USERS
IBM 360-70 USERS
RPG II BAL COBOL

Certified Software Products, Inc
3140 Harbor Lane North
Minneapolis, Minn. 55441
612-546-6919

CATS® + GCS, inc.

APPLICATIONS SYSTEMS
ACCOUNTS PAYABLE
ACCOUNTS RECEIVABLE
INVENTORY RECORD KEEPING
PAYROLL
GENERAL LEDGER

GCS is now the exclusive sales and service organization for CATS systems developed by Computerwares International. Call:

GCS
COMPUTERWARES INTERNATIONAL DIVISION (205) 539-9492
P. O. Box 5148
Huntsville, AL 35801

McCORMACK & DODGE CORPORATION

HAS
DEVELOPED
MARKETED
MAINTAINED

Accounting-oriented software products over the past five years.
Over 400 companies in the U.S. are using one or more of the following:

Fixed Asset Analysis & Accounting System
Accounts Receivable System
Investment Analysis System
Accounts Payable System

McCORMACK & DODGE CORPORATION

One Wells Avenue
Newton, Mass. 02159
(617) 965-3750

SOFTWARE FOR SALE

PAYROLL PERSONNEL

- All COBOL-48K or above
- Variable of fixed input
- Disk or tape-IBM or others
- State and local taxes
- DOS or OS
- Unlimited deduction & earnings
- Vacation and sick leave acctg.
- Skill and education profile
- Outstanding documentation
- 30 day trial

40+ Users • Still $960

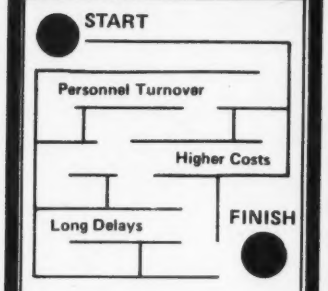
Call or write Today
Occidental Computer
805 S. San Fernando Rd.
Burbank, Calif. 91505
(213) 843-2722

Paymaster Remedies Payroll Problems

- a comprehensive payroll system
- now serving over 1000 companies
- license for as low as $250 a month
- up to 20 customized deductions and/or allowances . . . all with Y-T-D totals
- handles piecework, including calculations of make-up pay
- accepts input from time cards
- accepts input from terminals
- integrated job costing
- labor distribution
- integrates personnel/payroll records
- completely compatible with IBM 360/370 batch and RJE; Honeywell 200/2000; and Burroughs 1700—4700
- available to companies, institutions and service firms under licensing or purchase

COMTECH

P.O. Box 784 Reston, Va., 22070
Telephone (703) 471-7141
Canadian payroll package Also Available
Call (416) 492-1480



Infonational has the easy solution to your accounting systems puzzle.

If you're the one with the problem of developing financial systems for your company, let us help you out. Instead of expensive and time consuming custom development, install an Infonational:

- **GENERAL LEDGER**
- **ACCOUNTS PAYABLE**
- **ACCOUNTS RECEIVABLE/ SALES ANALYSIS**
- **FIXED ASSET**

Solving your **FINANCIAL SYSTEMS** problems is our business.

INFONATIONAL
THE FINANCIAL SYSTEMS COMPANY

Boston (617) 769-5942
Chicago (312) 332-6738
Dallas/Forth Worth (817) 732-6603
New York (212) 489-1600

6626 Convoy Court
San Diego, Ca. 92111
(714) 560-7070

WE SHIP IN ONE DAY

DEC
PDP 8, 9, 10, 11, 15, CPU's
PERIPHERALS & MODULES

DATA GENERAL
Nova 4000 CPU & Peripherals

H.P.
HP2116C CPU & Peripherals

IBM
S3 components
360 Peripherals
360/20 System
7094, 1710
1410, 1620 Systems

SEL
810A, 840MP &
Peripherals

UNIVAC
1108 CPU & Peripherals
418 II CPU, 1004, 1005,
9200, 9300 CPU's &
Peripherals, RCA Series 70

HIS
DDP 316, 416, 516, CPU's
Peripherals & U PACS
115, 120, 200, 1200, 1250
2200 CPU's & Peripherals

TELETYPE
33, 35, 37 . . . ASR, KSR, RO

DATA RECORDERS
MDS 1101, HIS 701, 2

PRINTERS
All Speeds-MDS, Data Printer,
Data Products, Data Mark,
Potter, A.B. Dick, Centronics

CARD READERS
Data Products, Documation,
Motorola, PDI 300

CARD PUNCHES
GDI, IBM

PAPER TAPE READERS
Digitronics, Data Scan

PAPER TAPE PUNCHES
Teletype BRPE, Tally

TAPE DRIVES
Ampex, Digidata, Kennedy,
Pertec, Sykes

Disk Drives CDC, IBM
Drums Vermont, Bryant,
ADS Multiplexors,
IBM Selectric I/O's,
Datum Formatters,
Tally Terminals

****

TRADE-INS ACCEPTED

****

617/261-1100

AMERICAN USED COMPUTER CORPORATION

P.O. BOX 68
KENMORE STATION
BOSTON, MASS. 02215
Member Computer Dealers Assoc.

Only One Improves Quarter Earnings

Revenues on the Rise at 3 T/S Firms

Revenues were on the rise for three time-sharing firms – International Timesharing Corp., Keydata Corp. and On-Line Systems – but only On-Line managed to show an increase in earnings for the most recent quarter. Results of all three firms improved during the six- or nine-month periods.

Minneapolis-based International Timesharing's third-quarter earnings were "heavily impacted by losses from the IBM 360/65-based operation which we acquired in October," explained President William Klink.

"While the results from our newly acquired IBM capability reversed the profit trend of the last three quarters, management expects that the impact on our next fiscal year and subsequent years will be positive and substantial," he said.

Losses for the third quarter ended Feb. 28 grew to $250,462 or 13 cents a share compared with $57,611 or 3 cents a share in the year-ago period.

Revenues rose to $1.4 million from $912,962 last year.

In the nine months, however, losses decreased to $100, 387 or 5 cents a share from $267,433 or 13 cents a year ago. Revenues jumped 48% to $4.2 million from $2.8 million in the 1973 period.

Conversion Slows Keydata

Keydata Corp.'s second-quarter and first-half earnings were slowed by implementation delays and nonrecurring costs from conversion of the nationwide network to a new high-speed terminal unit, explained President John T. Gilmore Jr.

The program is now 80% complete, he added.

During the quarter ended Jan. 31, revenues rose 27% to $2.9 million from $2.3 million in the year-ago period.

Earnings, after terminal conversion costs of $117,000, totaled $124,000 or 5 cents a share compared with $201,000 or 7 cents a share in the same period last year.

For the six months, however, earnings rose to $427,000 or 16 cents a share after a $167,000 conversion charge, compared with earnings of $377,000 or 13 cents a share in the year-ago period.

Revenues for the half rose 30% to $5.8 million from $4.4 million a year ago.

When fully installed, newly booked services will produce "additional repetitive revenues of more than $3 million a year," Gilmore said.

On-Line Improves

At On-Line Systems, both earnings and revenues grew for the nine months and third quarter.

In the quarter, earnings totaled $409,292 or 46 cents a share compared with $220,950 or 28 cents a share in the year-ago period. Revenues rose to $2.5 million from $1.6 million.

For the nine months, earnings and revenues set records, with earnings totaling $1.1 million or $1.32 a share compared with $456,010 or 58 cents a share last year.

Revenues for the period jumped 51% to $6.9 million from $4.6 million in the year-ago period.

President Jack Roseman credited the continued improved performance to new business and increased usage of proprietary software products by existing customers.

Calcomp Has 'Largest Quarter' Yet

ANAHEIM, Calif. – With the firm's "largest quarter and nine months" completed, it appears California Computer Products, Inc. will achieve revenues of $100 million during 1974, as projected by President Lester L. Kilpatrick.

In the third quarter ended March 31, earnings rose to $3.1 million or $1.01 a share, including a $1.4 million tax credit, compared with earnings of $976,000 or 33 cents a share in the year-ago period.

Revenues rose to $34.7 million from $21.3 million in the same 1973 period.

In the nine months, earnings jumped to $6.7 million or $2.20 a share, including a $3 million tax credit, compared with a loss of $603,000 or 21 cents a share in the year-ago period.

Revenues reached $91.7 million from $54.8 million last year.

...Toward the Bottom Line

Xiox International laid its 1973 loss of $397,735 to higher interest rates on the computer portfolios the company leases, and an erosion of lease rates on the portfolio in excess of those anticipated. Last year the company had a profit of $11,281.

$$$

Mirco Systems received multiple orders totaling more than $250,000 during one week in March. The orders from Honeywell, General Automation and Data 100 include the Mirco Flash test generation software package and the Mirco 410 Logic Circuit Test System.

Acquisitions

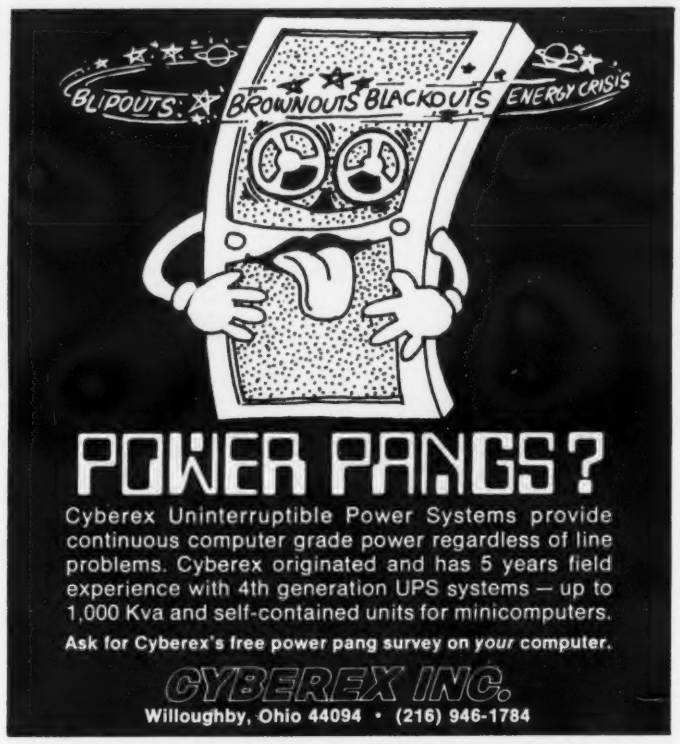
International Computer Corp. has agreed in principle to acquire all of the outstanding capital stock of **Vulcan Energy Resources Corp.** in exchange for ICC common stock to be issued over a five-year period in proportion to Vulcan's earnings in that period.

Kleffman Electronics, Inc. of Minneapolis has acquired the **computer hardware manufacturing operation** of International Timesharing Corp.

Almqvist & Wiksell Informatics Corp. has acquired **Magnetic Input Services Corp.**

Time Brokers, Inc. has acquired all rights to **Abacus,** an O/S 360/370 accounting/billing system, from ADR, Inc.

TBS Computer Centers Corp. has been merged into **NCSS Holding Co., Inc.** Shareholders of record of TBS Computer Centers as of the close of business on March 11 will receive $9 a share for each share of TBS.



POWER PANGS?

Cyberex Uninterruptible Power Systems provide continuous computer grade power regardless of line problems. Cyberex originated and has 5 years field experience with 4th generation UPS systems – up to 1,000 Kva and self-contained units for minicomputers.

Ask for Cyberex's free power pang survey on *your* computer.

CYBEREX INC.
Willoughby, Ohio 44094 • (216) 946-1784

SERVICE BUREAU USERS

Cut your bill in half without changing bureaus

If you are running under IBM OS or OS/VS with programs written in COBOL and/or ASSEMBLER the use of SYNCPAC will enable you to achieve SUBSTANTIAL SAVINGS at "your" service bureau.

SYNCPAC is a proven, operating parallel-processing monitor that combines a multi-step job into a single step. Installation is *less than one day*.

SYNCPAC is currently available in New England within 60 days SYNCPAC will be available outside of New England.

For more complete information and at no cost – no obligation trial by SYNCPAC of one of your existing OS Job Streams call (617) 527-1426

The Software Group, Inc.

233 Needham Street, Newton Highlands, Mass. 02161
Tel: (617) 527-1426
Sales and Service Representatives of Software Packages.

COBOL REPORT WRITER AVAILABLE NOW FOR ASSEMBLER PROGRAMMERS

Three declarative and three imperative 360/370 assembler macros form a complete report writer facility for DOS users (OS versions will be considered).

The facility will easily pay for itself in one months usage through direct programming savings. An average 10 line report can be coded in 1 hour or less, and normally debugged in 1 or 2 test shots. For DOS/VS users, the generated coding will fit into 2 pages, minimizing any paging required. The facility is entirely compatible with any spooling system you might currently be using.

The report writer facility automatically performs:

New page headings, control break lines, etc.

Control and grand total accumulations

Construction and moving of all variable data into the lines

Decimal editing functions via Cobol edit descriptions

Inclusion of date and page number in first heading line

For a free copy of the documentation call or write:
Peter J. Tofil
Advo Systems, Inc.
239 W. Service Rd.
Hartford, Ct. 06101
(203) 525-9101

During the National Computer Conference May 6-10 I may be contacted at:
Playboy Towers
160 E. Walton Place
Chicago, Ill.
(312) 751-8100

Earnings Reports

DATA GENERAL
Three Months Ended March 16

	1974	1973
Shr Ernd	$.23	$.17
Revenue	14,942,000	11,160,000
Earnings	1,859,000	1,396,000
6 Mo Shr	.46	.32
Revenue	29,779,000	20,987,000
Earnings	3,714,000	2,648,000

SIGNETICS
Three Months Ended March 24

	1974	1973
Shr Ernd	$.58	$.32
Revenue	31,454,000	17,841,000
Tax Cred	437,000	592,000
Earnings	3,238,000	1,342,000

MATHEMATICA
Six Months Ended Dec. 31

	1973	1972
Shr Ernd	$.44	$.38
Revenue	5,251,400	4,879,900
Earnings	309,500	269,200

LOGICON
Three Months Ended Dec. 31

	1973	1972
Shr Ernd	$.14	$.10
Revenue	5,350,541	3,011,261
Earnings	118,899	77,890
9 Mo Shr	.32	.40
Revenue	13,733,592	9,176,514
Earnings	276,599	349,272

BURROUGHS
Three Months Ended March 31

	1974	1973
Shr Ernd	$.55	a$.49
Revenue	322,797,000	274,435,000
Spec Cred	.....	b2,425,000
Earnings	21,376,000	18,771,000

a-Adjusted to reflect a two-for-one stock split in March 1974. b-From sale of securities.

IBM
Three Months Ended March 31

	1974 (000)	1973 (000)
Shr Ernd	$2.94	a$2.34
Revenue	3,001,741	2,450,511
Earnings	431,264	340,132

a-Adjusted for a 25% stock dividend in May 1973.

GENERAL INSTRUMENT
Year Ended Feb. 28

	1974	1973
Shr Ernd	$1.82	a$1.11
Revenue	425,697,674	318,630,079
Earnings	13,955,564	9,248,482
3 Mo Shr	.36	a.23
Revenue	111,773,155	86,091,243
Earnings	2,830,734	1,942,243

a-Adjusted to reflect a 2% stock dividend paid in May 1973.

NATIONAL DATA
Nine Months Ended Feb. 28

	1974	1973
Shr Ernd	$.20	$.29
Revenue	23,884,495	9,931,668
Tax Cred	.....	321,600
Earnings	1,055,259	1,419,743

HAZELTINE
Three Months Ended March 31

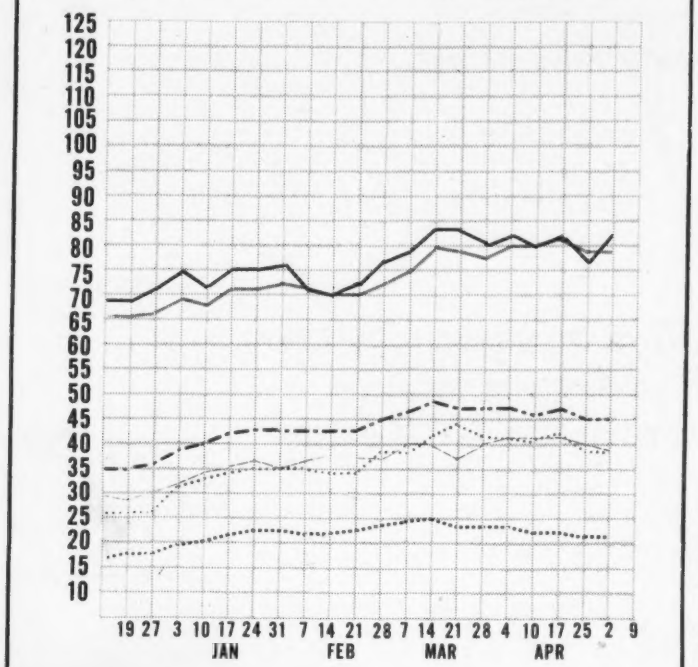
	1974	1973
Shr Ernd	$.10	$.22
Revenue	28,062,000	18,303,000
Tax Cred	.....	235,000
Earnings	193,000	441,000

CAMBRIDGE MEMORIES
Three Months Ended March 2

	a1974	1973
Shr Ernd	$.15	$.11
Revenue	5,627,264	2,769,746
Tax Cred	.....	5,880
Earnings	204,856	140,076
6 Mo Shr	.32	.20
Revenue	10,495,779	4,666,327
Tax Cred	.....	62,880
Earnings	426,510	258,488

a-Results reflect a provision of $250,000 to the reserve for doubtful accounts for an expected loss on an accounts receivable.

COMPUTERWORLD Computer Stocks Trading Indexes

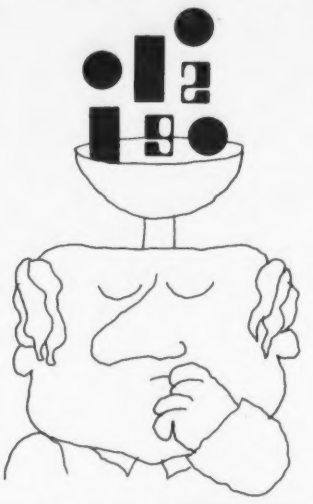


* WANTED *

Firms to: Buy, Sell, Lease, Sub-Lease → 360 & 370 Systems and I/O

Write or Call Collect — Today
Its our only business

NVC COMPUTER SALES, INC.
Suite 616, Benjamin Fox Pavilion
Jenkintown, Pa. 19046 • (215)-887-5404
Member Computer Dealers Assoc.



Need Input on IBM 360?

Call Tony Pettine (609) 424-3344 for Leasing Information
Immediate Availability

MDC Corporation
American Stock Exchange
26 Springdale Rd., Cherry Hill, N.J. 08003
(609) 424-3344 or (215) LO4-3322
Offices in: Cherry Hill, N.J. Columbus, Ohio Philadelphia, Pa. Washington, D.C.

TRADE*QUOTES

Computerworld Stock Trading Summary

All statistics compiled, computed and formatted by TRADE★QUOTES, INC. Cambridge, Mass. 02139

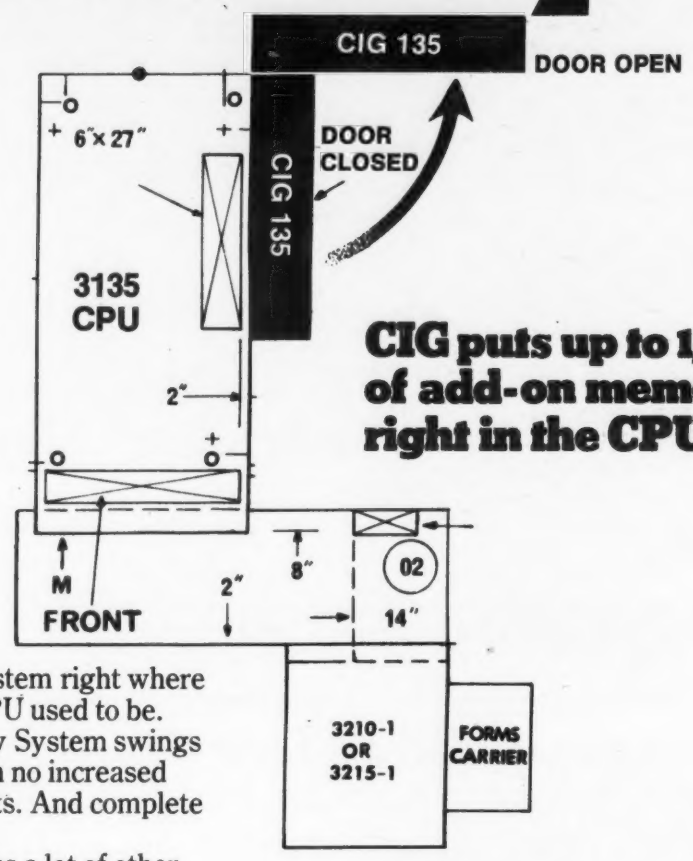
FXCH		1973-74 RANGE (1)	CLOSE MAY 2 1974	WEEK NET CHNGE	WEEK PCT CHNGE
	COMPUTER SYSTEMS				
N	BURROUGHS CORP	49-124	102 3/4	+7	+7.3
N	COLLINS RADIO	14- 26	24 3/4	0	0.0
O	COMPUTER AUTOMATION	5- 20	11 3/4	+1 1/2	+14.6
N	CONTROL DATA CORP	30- 62	31 3/4	+1 1/2	+4.9
N	DATA GENERAL CORP	28- 49	33	+1	+3.1
O	DATAPOINT CORP	10- 21	12 3/4	+1	+8.5
O	DIGITAL COMP CONTROL	2- 6	3 3/4	- 1/8	-3.2
N	DIGITAL EQUIPMENT	73-121	116 1/8	+12 3/8	+11.9
N	ELECTRONIC ASSOC.	2- 9	2 3/8	0	0.0
A	ELECTRONIC ENGINEER.	6- 14	9 3/4	- 1/8	-1.2
N	FOXBORO	23- 48	37	+3	+8.8
O	GENERAL AUTOMATION	22- 55	38 1/2	+6 1/2	+20.3
O	GPT COMPUTER CORP	1- 3	1 1/2	+ 1/8	+9.0
N	HEWLETT-PACKARD CO	70- 90	84 3/8	+5 1/8	+6.4
N	HONEYWELL INC	68-130	77 1/2	+2	+2.6
N	IBM	292-360	299 3/8	+7 3/4	+3.4
O	INTERDATA INC	7- 22	19 3/4	+2 3/4	+16.1
O	MICRODATA CORP	2- 10	3 5/8	+ 1/8	+3.5
N	NCR	27- 46	37 1/4	+ 3/4	+2.0
N	RAYTHEON CO	22- 39	35 1/4	+2 3/4	+8.4
N	SINGER CO	32- 76	31 7/8	+ 3/8	+1.1
N	SPERRY RAND	36- 56	39 1/2	+ 7/8	+2.2
A	SYSTEMS ENG. LABS	1- 8	2	+ 1/8	+6.6
N	TEXAS INSTRUMENTS	83-138	106 7/8	+8 1/2	+8.6
O	ULTIMACC SYSTEMS INC	1- 11	1 3/8	+ 1/8	+10.0
N	VARIAN ASSOCIATES	10- 20	10 3/8	+ 3/8	+3.7
N	WANG LABS.	13- 36	13 3/4	- 3/8	-2.6
N	XEROX CORP	106-168	111 1/4	+2 1/4	+2.0
	LEASING COMPANIES				
A	BOOTHE COMPUTER	1- 5	1 1/8	0	0.0
O	BRESNAHAN COMP.	1- 2	2 1/8	0	0.0
O	COMDISCO INC	4- 17	3 7/8	- 3/8	-8.8
O	COMMERCE GROUP CORP	3- 6	5	- 1/4	-4.7
O	COMPUTER EXCHANGE	1- 1	1/4	0	0.0
A	COMPUTER INVSTRS GRP	2- 8	2	0	0.0
O	COMPS INSTALLATIONS	1- 2	1 1/8	0	0.0
M	DATRONIC RENTAL	1- 3	1 5/8	- 1/8	-7.1
A	DCL INC	0- 3	1/2	+	+14.1
N	DPF INC	3- 9	3 5/8	+ 1/8	+3.5
O	EDP RESOURCES	1- 3	3 1/4	0	0.0
A	GRANITE MGT	2- 6	2	0	0.0
A	GREYHOUND COMPUTER	3- 6	3 3/4	+ 1/8	+3.4
A	ITEL	4- 12	5	+ 1/8	+2.5
N	LEASCO CORP	8- 18	10	+ 1/4	+2.5
O	LEASPAC CORP	1- 8	1 1/4	0	0.0
O	LECTRO MGT INC	1- 2	1/2	+ 1/8	+33.3
O	NPG INC	3- 15	3 5/8	+ 1/8	+3.5
A	PIONEER TEX CORP	3- 10	3 3/8	0	0.0
A	ROCKWOOD COMPUTER	1- 3	3/4	- 1/8	-14.2
N	U.S. LEASING	15- 36	15 1/8	-1 7/8	-11.0

FXCH		1973-74 RANGE (1)	CLOSE MAY 2 1974	WEEK NET CHNGE	WEEK PCT CHNGE
	SOFTWARE & EDP SERVICES				
O	ADVANCED COMP TECH	1- 2	1 1/8	0	0.0
A	APPLIED DATA RES.	2- 8	2 7/8	- 1/8	-4.1
O	APPLIED LOGIC	1- 3	3/8	0	0.0
N	AUTOMATIC DATA PROC	39- 94	40	+ 1/4	+0.6
O	BRANDON APPLIED SYST	1- 1	1/4	0	0.0
O	CENTRAL DATA SYSTEMS	3- 9	3 1/2	0	0.0
O	COMPUTER DIMENSIONS	1- 5	2	0	0.0
O	COMPUTER HORIZONS	1- 8	3 1/2	0	0.0
O	COMPUTER NETWORK	1- 5	1 3/8	- 1/8	-8.3
N	COMPUTER SCIENCES	2- 6	3	+ 1/4	+9.0
O	COMPUTER TASK GROUP	1- 2	3/8	- 1/8	-25.0
O	COMPUTER TECHNOLOGY	1- 3	1/2	0	0.0
O	COMPUTER USAGE	3- 9	3	- 1/4	-7.6
O	COMRESS	1- 2	3/8	0	0.0
O	COMSHARE	2- 9	2 3/4	0	0.0
N	CORPURA CORP	2- 15	2 3/8	0	0.0
O	DATATAB	1- 4	1 3/4	0	0.0
A	ELECT COMP PROG	1- 2	1/4	0	0.0
N	ELECTRONIC DATA SYS.	12- 56	15 1/2	+1 1/4	+8.7
O	INFONATIONAL INC	1- 2	1/2	0	0.0
O	INFORMATICS	2- 7	6 3/4	0	0.0
O	T.O.A. DATA CORP	1- 1	3/8	0	0.0
O	IPS COMPUTER MARKET.	1- 5	7/8	- 1/8	-12.5
O	KEANE ASSOCIATES	2- 5	3 1/2	0	0.0
O	KEYDATA CORP	4- 12	4 1/8	0	0.0
O	LOGICON	2- 7	3 5/8	+ 1/4	+7.4
A	MANAGEMENT DATA	1- 5	1 3/8	0	0.0
O	NATIONAL CSS INC	18- 42	25	-1 1/2	-5.6
O	NATIONAL COMPUTER CO	1- 1	3/4	- 1/8	-25.0
O	NATIONAL INFO SRVCS	1- 2	1/4	0	0.0
P	ON LINE SYSTEMS INC	12- 29	28 1/2	+3 3/8	+13.4
N	PLANNING RESEARCH	2- 7	3	+ 1/4	+9.0
O	PROGRAMMING METHODS	17- 25	17	0	0.0
O	PROGRAMMING & SYS	1- 1	1	- 1/8	-11.1
O	RAPIDATA INC	2- 24	2 1/4	- 5/8	-21.7
O	SCIENTIFIC COMPUTERS	1- 3	7/8	0	0.0
O	SIMPLICITY COMPUTER	1- 4	1	0	0.0
O	TCC INC	1- 1	1/4	- 1/8	-33.3
O	TYMSHARE INC	5- 13	10 3/4	+ 1/4	+2.3
O	UNITED DATA CENTER	3- 5	3 1/4	0	0.0
A	UOS SYSTEMS	2- 8	3 1/8	+ 1/4	+4.6
M	WYLY CORP	3- 11	3 5/8	+ 1/8	+3.5
	PERIPHERALS & SUBSYSTEMS				
N	ADDRESSOGRAPH-MULT	8- 34	7 3/4	0	0.0
O	ADVANCED MEMORY SYS	4- 23	3 3/4	0	0.0
N	AMPEX CORP	3- 7	3 3/4	+ 1/8	+3.4
O	ANDERSON JACOBSON	2- 6	2 3/4	+ 1/4	+10.0
O	BEEHIVE MEDICAL ELEC	4- 10	3 1/2	- 3/4	-17.6
A	BOLT,BERANEK & NEW	6- 12	7 3/8	+ 1/8	+1.7
N	BUNKER-RAMO	6- 19	6 1/4	- 1/4	-3.8
A	CALCOMP	8- 16	10 1/2	+ 7/8	+9.0
O	CAMBRIDGE MEMORIES	8- 17	10 5/8	+ 5/8	+6.2
O	CENTRONICS DATA COMP	13- 38	20 1/2	+1 1/2	+7.8
O	CODEX CORP	8- 19	12	+ 3/4	+6.6
O	COGNITRONICS	1- 3	1 1/8	0	0.0

FXCH		1973-74 RANGE (1)	CLOSE MAY 2 1974	WEEK NET CHNGE	WEEK PCT CHNGE
O	COMPUTER COMMUN.	1- 4	5/8	- 1/8	-16.6
A	COMPUTER EQUIPMENT	1- 3	1 5/8	+ 1/8	+8.3
O	COMPUTER MACHINERY	4- 13	4 1/8	+ 3/8	+10.0
O	COMPUTER TRANSCEIVER	1- 6	1 1/8	- 1/8	-10.0
N	CONRAC CORP	13- 32	19 1/2	+1 3/4	+9.8
O	DATA ACCESS SYSTEMS	1- 3	2	0	0.0
O	DATA 100	6- 19	10 1/4	+ 3/4	+7.8
A	DATA PRODUCTS CORP	2- 5	3 5/8	0	0.0
O	DATA RECOGNITION	1- 3	1/2	0	0.0
O	DATA TECHNOLOGY	1- 5	3 3/8	+ 1/8	+3.8
O	DECISION DATA COMPUT	6- 40	9 1/2	+2	+26.6
O	DELTA DATA SYSTEMS	1- 1	3/4	0	0.0
O	DIXAN CONTROLS	1- 4	1 1/4	0	0.0
N	ELECTRONIC M & M	3- 6	3	0	0.0
O	FABRI-TEK	2- 5	2 1/2	+ 1/4	+11.1
O	GENERAL COMPUTER SYS	3- 9	2 3/4	0	0.0
N	GENERAL ELECTRIC	51- 76	53	+1	+1.9
N	HAZELTINE CORP	4- 9	4 5/8	+ 1/8	+2.7
O	INFOREX INC	2- 23	2 3/4	+ 1/4	+10.0
O	INFORMATION DISPLAYS	1- 2	3/4	+ 1/8	+50.0
O	INFORMATION INTL INC	8- 15	9 3/4	0	0.0
A	LUNDY ELECTRONICS	3- 9	2 7/8	0	0.0
O	MANAGEMENT ASSIST	1- 1	1/4	0	0.0
N	MEMOREX	2- 19	4 5/8	+ 1/4	+5.7
A	MILGO ELECTRONICS	12- 28	12 3/4	-1	-7.2
N	MOHAWK DATA SCI	2- 13	3	0	0.0
O	ODEC COMPUTER SYST.	2- 6	1 3/4	0	0.0
O	OPTICAL SCANNING	2- 8	3 5/8	0	0.0
O	PERTEC CORP	3- 9	3 3/8	0	0.0
O	PHOTON	3- 7	3 3/4	0	0.0
A	POTTER INSTRUMENT	2- 9	3 3/8	+ 1/8	+3.8
O	PRECISION INST.	2- 6	1 3/4	+ 1/4	+16.6
O	QUANTOR CORP	4- 10	4 1/4	+ 1/4	+4.1
O	RECOGNITION EQUIP	2- 8	3 7/8	+ 5/8	+19.2
N	SANDERS ASSOCIATES	5- 19	4 3/8	0	0.0
O	SCAN DATA	1- 6	1 7/8	0	0.0
O	STORAGE TECHNOLOGY	11- 34	12	+1 1/4	+11.6
O	SYCOR INC	8- 20	8	- 1/4	-3.0
O	TALLY CORP.	2- 14	3 5/8	- 1/8	-3.3
O	TEC INC	5- 9	5	+ 1/4	+5.2
N	TEKTRONIX INC	30- 56	42 1/2	+2 7/8	+7.2
N	TELEX	3- 8	2 5/8	+ 1/8	+5.0
O	WANGCO INC	7- 13	12	0	0.0
O	WILTEK INC	6- 10	5 1/2	- 1/2	-8.3
	SUPPLIES & ACCESSORIES				
O	BALTIMORE BUS FORMS	4- 9	5 3/4	0	0.0
A	BARRY WRIGHT	5- 13	6 3/8	- 1/4	-3.7
O	CYBERNATICS INC	1- 3	1 1/4	0	0.0
A	DATA DOCUMENTS	17- 47	46 1/2	+5 1/4	+12.7
O	DUPLEX PRODUCTS INC	6- 10	8 1/2	+ 1/8	+1.4
N	ENNIS BUS. FORMS	-- 8	6	- 1/2	-7.6
O	GRAHAM MAGNETICS	7- 20	8 3/4	+ 3/4	+9.3
O	GRAPHIC CONTROLS	7- 13	10	+ 1/4	+2.5
N	3M COMPANY	69- 91	71 5/8	+ 3/8	+0.5
O	MOORE CORP LTD	46- 65	51	+3 1/4	+6.8
N	NASHUA CORP	34- 58	33 7/8	0	0.0
O	REYNOLDS & REYNOLD	24- 51	24 1/2	- 3/4	-2.9
O	STANDARD REGISTER	11- 20	14 1/2	- 1/2	-3.3
O	TAB PRODUCTS CO	7- 23	8	-1 1/2	-15.7
N	UARCO	15- 23	21	+1 1/2	+7.6
A	WABASH MAGNETICS	8- 8	4 5/8	- 1/4	-4.2
N	WALLACE BUS FORMS	14- 26	20 3/4	+1 3/8	+7.0

FXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH
I=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

CIG 135: The Swinging Memory.



CIG puts up to 1,024K of add-on memory right in the CPU door.

CIG put an entire add-on memory system right where the side-door of the IBM 370/135 CPU used to be.

Which means the CIG 135 Memory System swings in the same arc as the IBM door. With no increased clearances or floor space requirements. And complete CPU maintenance accessibility.

The CIG 135 Swinging Memory has a lot of other unique features going for it, too.

It's reconfigurable. And may be switched on-line or off-line under operator control.

Its 1,024 bit memory chip is so fast, that only the IBM standard ECCL is used. Which increases reliability and lets the CIG 135 Swinging Memory function perfectly with only two major components: Memory Modules and Power Modules.

Less hardware. Less to go wrong.

Consider:

- **Upgrades to 1,024K. Twice IBM capacity.**
- **Unique CIG CPU model changes require no floppy disk changes.**
- **No increase in floor space.**
- **Complete IBM maintenance accessibility.**
- **On-line/Off-line switch.**
- **Reconfigurable by operator.**
- **Uses IBM ECCL.**

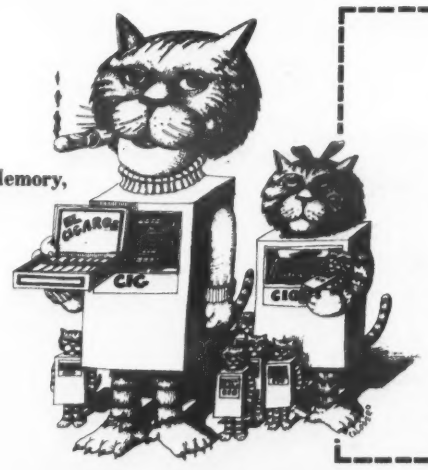
CIG. More than just memory.

When you're first in the add-on memory business and you've got more than 650 satisfied 360/370 customers to show for it, you've got the credentials to be called a memory expert.

But CIG is more than just memory. We're big in 360/370 leasing, too. We can design and deliver a complete hardware/financial package that'll give you CPU, memory, and peripherals, and save you a small fortune, to boot.

We're doing that for other people. We know we can do that for you. Just check us out. And call us in.

When you're the Top Cat in Add-On Memory, you never stop improving the breed.



CIG

CIG COMPUTER PRODUCTS, INC.

A Subsidiary of Computer Investors Group, Inc.

1351 Washington Blvd., Stamford, Conn. 06902

Dear CIG:

☐ I'd like to check your prices. Have your rep call me at_____.
☐ Send a copy of "Add on Memory for the 370/135."
☐ Send info on CIG Memory for the 360/_____, 370/_____.

Name_____ Title_____

Company_____

Street_____

City_____ State_____ Zip_____

CW: 58